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IN THE

Supreme Court of the United States

October Term, 1930

No. 19

LEKTOPHONE CORPORATION,
Petitioner,

vs.

THE ROLA COMPANY,
Respondent.

BRIEF FOR RESPONDENT

on Writ of Certiorari to the United States Circuit Court of Appeals for the Ninth Circuit.

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THOMAS G. HAIGHT,
THEODORE S. KENYON,
Counsel for Respondent.

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On Certiorari to the United States Circuit Court of Appeals for the 9th Circuit.

BRIEF FOR RESPONDENT.

Statement of the Case.

Jurisdiction:

This case is here on a writ of certiorari to the Circuit Court of Appeals for the Ninth Circuit. The writ was issued, presumably, because of a conflict of decision between the Circuit Court of Appeals for the Third Circuit and the Circuit Court of Appeals for the Ninth Circuit, regarding the scope of patent No. 1,271,529, granted to one Hopkins on July 2, 1918.

Decisions of the Courts Below:

The petitioner[1] brought suit for an alleged infringement of this patent and another (No. 1,271,527) issued on the

[1] For convenience, Petitioner will hereinafter be referred to as "Plaintiff" and Respondent as "Defendant". The plaintiff's alleged invention will be referred to as "The Hopkins device" and the alleged infringing device will be referred to as "The Rola Loud Speaker". Throughout this brief, unless otherwise noted, italics may be assumed to be ours.

same date to the same patentee, in the District Court for the Northern District of California. The case was heard by Judge Bourquin, who held that the claims in suit of patent No. 1,271,527 were invalid and that the other patent, even if valid, had not been infringed by the defendant.[2] His decision was affirmed by the Circuit Court of Appeals for the Ninth Circuit.[3] Both Courts rendered careful and well-considered opinions. They will be found not only in the official reports and in the record, as indicated in the footnote,[4] but also on pages 74 to 107 of a pamphlet containing opinions and decrees of various courts in litigation instituted by the present petitioner, hereinafter cited as "Lektophone Litigation". As the Circuit Court of Appeals for the Third Circuit likewise held patent No. 1,271,527 invalid, that patent is not before this Court (except as it may be brought in by reason of its relationship to the patent in suit), there being no conflict of decision between Circuit Courts of Appeals in respect to it.[5] Hereafter, unless otherwise specified, when using the expression "patent in suit", it will be understood that we refer to patent No. 1,271,529.

The Patent in Suit and a Brief Outline of Its History:

The patent in suit is an alleged division of an application filed on July 14, 1913, and which later issued as patent No. 1,271,527. Both relate to sound reproducing instruments and had for their object a means for reproducing sound "from a record or equivalent element"[6] in free air, *i. e.* without the use of a sound box and horn.

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[2] *Lektophone Corp.* v. *The Rola Company*, 27 Fed. (2d) 758.
[3] 34 Fed. (2d) 764.
[4] R. pp. 13, 112.
[5] *Webster* v. *Splitdorf*, 264 U. S. 463.
[6] R. p. 134.

The devices of each patent were primarily designed for use with a phonograph or gramophone. The invention is alleged in the specifications of the patent in suit to consist "in the provision of a tympanum of *novel construction*".[7] The tympanum is to be constructed of "light", "crisp", "strong", "vibratile" material, "having considerable rigidity within itself", and is to comprise "an *annular plane peripheral portion* or *supporting* rim", the outer edge of which is "*rigidly*" held or supported between two "ponderous" rings, and "a central conical *portion*" rising from the inner edge of the rim.[8] It is further stated in the patent that "if satisfactory regeneration of sounds" is to be had, the diameter of the tympanum, *i. e.*, "the aperture in the rings" should exceed 9 inches.[9] This latter feature was expressly made an element of all of the claims of the patent, save two, and was stated by the patentee during the prosecution of his application in the patent office to be of the very "essence" of his invention, and "*essential* to the success" of the machine. There are other statements in the specifications as to how the tympanum should be constructed. These will be hereafter discussed.

The claims, eight in number (all sued upon), are thus summarized by the District Court:[10]

> "Claims 1 to 8 are for the tympanum of the patents, claims 1, 2, 3, 5, 6, and 7 for a tympanum 'having a free area exceeding nine inches in diameter,' and claims 4 and 8, for one having 'sufficient area' to realize the invention. In his specifications and during proceedings prior to patents, Hopkins

[7] R. p. 136.
[8] R. p. 137.
[9] R. p. 137.
[10] R. p. 14; 27 Fed. (2d) 758, 759.

> committed himself to the theory that a tympanum exceeding nine inches in diameter alone would function, was necessary, and was his discovery and invention. Accordingly all claims are so taken. Likewise did he commit himself to a tympanum necessarily made of a particular kind of material and construction, tho not incorporated in any—these claims."

Mr. Hopkins, who is a patent attorney or solicitor by profession, was, at the time the alleged invention was made, employed by Thomas A. Edison and was making experiments with conical diaphragms to be used in connection with phonographs. At that time, conical diaphragms both with and without annular rims tightly gripped at their periphery were well known in the art, having been covered and described in many patents and publications which will be hereinafter referred to. As a result of his experiments, Hopkins evolved the device of the patent in suit. Mr. Edison was apparently not impressed with it, took little notice of it, and allowed Hopkins to leave his employ taking all of his models with him (R. p. 77). He went to a firm of patent attorneys (the predecessor of the firm which represents the plaintiff), which firm, five years after the application was filed, succeeded in having the patent in suit issued. The plaintiff corporation was also formed by this firm. The application for the patent had a rather stormy career in the Patent Office, and was only allowed after definite limitations as to the size of the tympanum and the method in which it should be secured at its edge, above, and to be hereinafter referred to, had been inserted in the claims, and after these features had been represented to the Patent Office as "essential elements" of the invention. For instance, accompanying one amendment, the patentee said:[11]

[11] R. p. 253.

> "We believe that it will now be apparent to the Examiner that the selection of the *particular dimensions is of the essence of the invention and attains novel results arising from the particular dimensions* and such as could not be obtained by the devices shown in the references."

Later, in response to another rejection by the Examiner, he said:[12]

> "*It is essential to the success of applicant's machine that the tympanum be of large area and that the base of the vibratile portion thereof exceed nine inches in diameter,* and furthermore that the peripheral edge of the tympanum, *exterior of the vibratile portion, be rigidly secured or tightly gripped between the rings* of the supporting frame. These definitions of the essential characteristics of the invention *have been included in the claims by the amendments aforesaid, and said claims are, therefore, believed to be allowable.*"

The device of the patent made no impress on the phonograph art. However, with the advent of radio broadcasting, and after the bringing out, in about 1924, by the Western Electric Company and possibly by a Mr. Farrand (who is an officer of the plaintiff corporation and one of its expert witnesses in this case) of paper cone loud speakers for use with radio receiving sets, it evidently occurred to the patentee or his attorneys that this Hopkins phonograph patent could be used to cover such radio cone loud speakers.

Litigation on the Patent:

Thereupon, suits were instituted on the patent from time to time by the present plaintiff, which had acquired

[12] R. p. 267.

title to the patents, and which is not a manufacturer but is simply engaged in granting licenses to manufacturers under some ten or twelve patents, including the patent in suit. The first suit was brought in the Eastern District of New York against the Sylo Lighting Fixture Company. It was decided in March of 1926 by Judge Campbell in favor of the plaintiff.[13] This decision was *reversed* by the Circuit Court of Appeals for the Second Circuit on the ground that there was no infringement, the Court specifically holding that it was not necessary for it to pass on the question of validity.[14] In reading this decision, it is important to bear in mind that much of the prior art offered in the present suit was not presented in that case. This is especially true of the Starling & Cole publication and the Dann and Lapp patent. Suit was also brought in the Southern District of New York against the Western Electric Company. The device there alleged to infringe was substantially the same as that which was before the Court in the *Sylo* case. Judge Thacher, who heard the *Western Electric* case, reached the conclusion that there was no infringement of the patent in suit.[15] He also held the claims then in suit of patent No. 1,271,527 invalid. His decree was *affirmed* by the Circuit Court of Appeals which again found it unnecessary to pass upon the validity of the patent.[16]

The type of loud speaker which was alleged in those cases to infringe is illustrated by a cut opposite page 44 of the Lektophone Litigation pamphlet. It consisted of two stiff paper cones placed base to base, with the apex of the one cone actuated by the operating rod and the other cone truncated. It was claimed that the sides of the truncated

[13] 11 Fed. (2d) 421, Lektophone Litigation, p. 1.
[14] 16 Fed. (2d) 7, Lektophone Litigation, p. 15.
[15] 20 Fed. (2d) 150, Lektophone Litigation, p. 25.
[16] 16 Fed. (2d) 10, Lektophone Litigation, p. 38.

cone corresponded to and were the equivalents of the annular rim of the patent.

Another suit was brought against the Brandes Products Corporation in the District of New Jersey, and resulted in a decree by the District Court that both patents were *invalid* and not infringed.[17] The decree in that case was reversed by the Circuit Court of Appeals for the Third Circuit.[18] It is the conflict between this decision and that of the Circuit Court of Appeals in the case at bar that has brought the case to this Court. The device claimed in that case to infringe is illustrated in a cut opposite page 60 of the Lektophone Litigation pamphlet. It had a thin rubber band between the edge of the base of the cone and the supporting rim. This was held by the Circuit Court of Appeals to be the equivalent of the annular rim of the patent.

That suit was followed by one against the Crosley Radio Corporation in the Southern District of Ohio, and resulted in a decision by Judge Hickenlooper that there was no infringement. He found it unnecessary to pass upon validity. The device claimed to infringe in that case is illustrated by a cut opposite page 72 of the Lektophone Litigation pamphlet. The edges of the base of the Crosley cone rested flexibly and yieldingly between layers of felt affixed to a two-piece tubular metallic ring. It was claimed that these layers of felt were the equivalent of the annular rim of the patent.

In the present suit, it is claimed that the limp kid between the periphery of the cone and the baffle board, although it has no sound regenerating qualities and is not of a "stiff, vibratile material," is the equivalent of the annular rim, and that it infringes notwithstanding the fact that

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[17] 16 Fed. (2d) 934, Lektophone Litigation, p. 46.
[18] 20 Fed. (2d) 155, Lektophone Litigation, p. 55.

at its base "the effective area" of defendant's tympanum is of very much less diameter than that specified as essential in the patent, and although even the cone *plus* the rim is less.

In the case of *Miller Brothers,* which is also before this Court on certiorari, it is claimed that a connecting band of cloth is the equivalent of the annular rim.

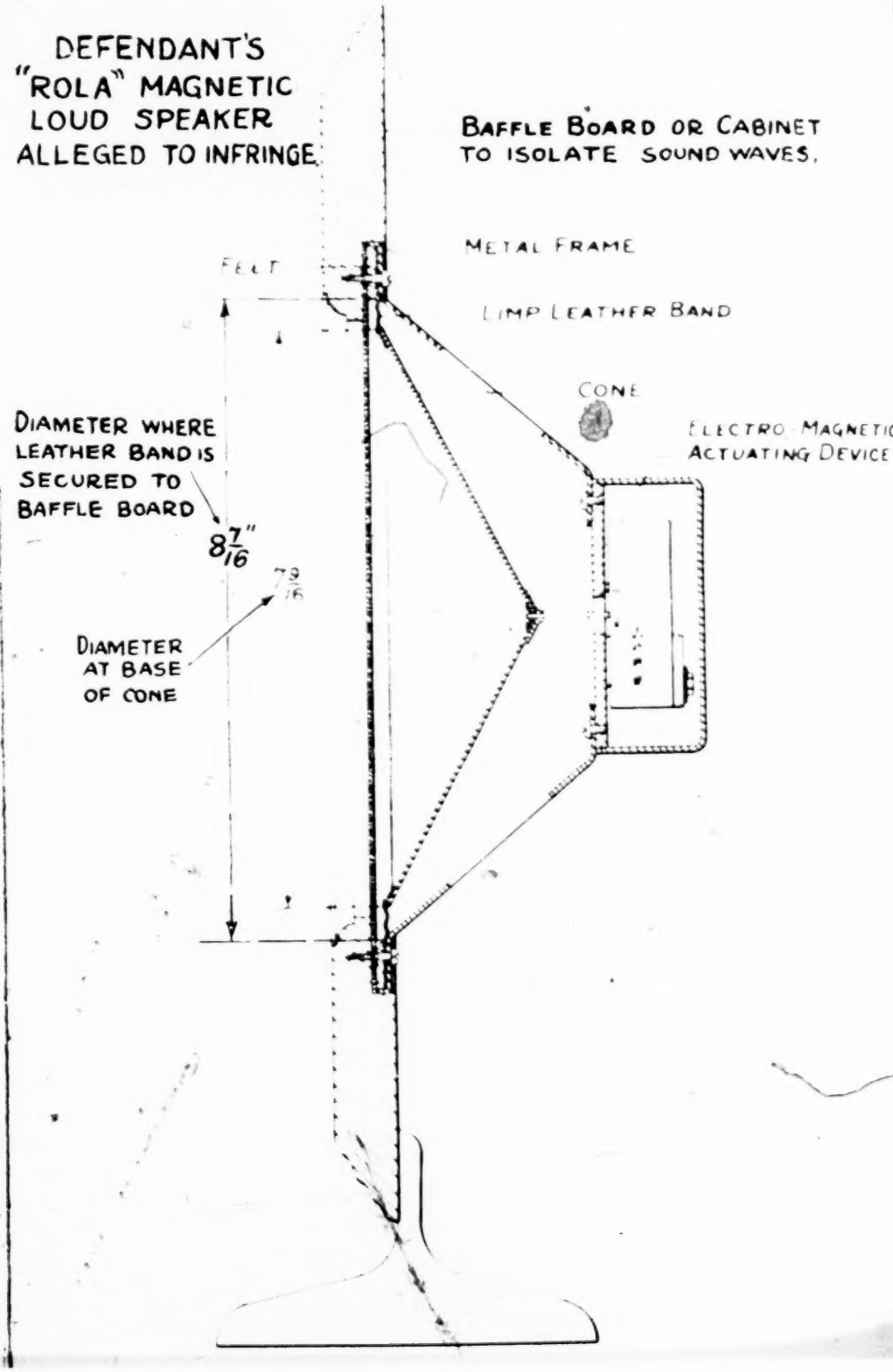
A suit was also brought in the High Court of Justice of England against S. G. Brown, Ltd.,[19] where an attempt was made to have it held that a cone loud speaker utilizing a plain ring of thin paper between the edge of the cone and the wooden frame infringed the patent. This attempt was unsuccessful both in the Lower Court and in the Court of Appeals.

Some suits were also brought in France and one in Germany. These are analyzed in an appendix to this brief.

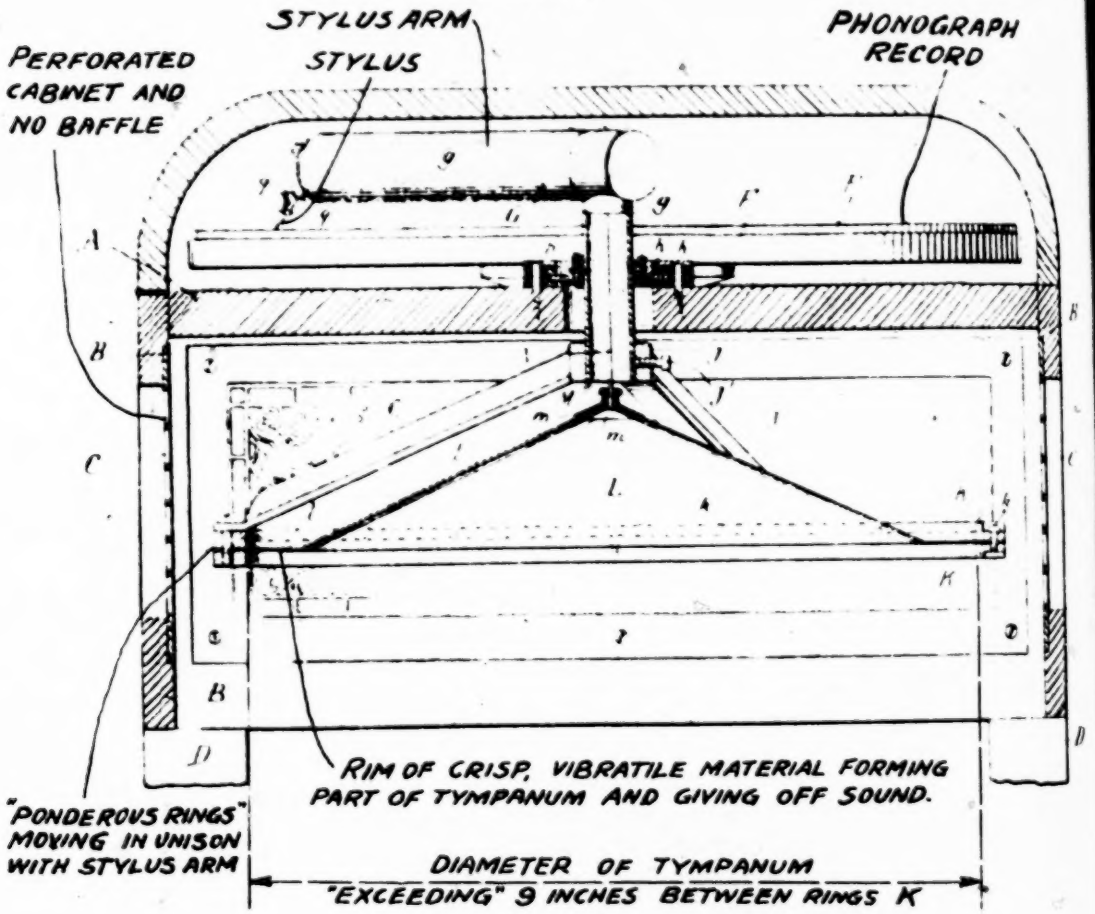
The Construction of the Patent which Plaintiff Seeks:

It is thus apparent that the plaintiff has tried and is endeavoring to have any cone loud speaker diaphragm of relatively large area, compared with those utilized in sound boxes, which employs a band or rim of any kind of material between the periphery of the cone (whether affixed or not) and the loud speaker support, adjudged to come within the scope of the patent, and thus to have given to the patent by *construction* an even broader scope and a wider range of equivalents than are ordinarily accorded to pioneer patents of the first importance. This construction is sought, in disregard of the limitations imposed by the Patent Office, and the claims, and notwithstanding that the device of the patent has had no commercial success or utility whatever in the phonograph art for which it was designed; and, that

[19] Lektophone Litigation, p. 192.


DEFENDANT'S
"ROLA" MAGNETIC
LOUD SPEAKER
ALLEGED TO INFRINGE
BAFFLE BOARD OR CABINET
TO ISOLATE SOUND WAVES.
METAL FRAME
FELT
LIMP LEATHER BAND
CONE
ELECTRO MAGNETIC
ACTUATING DEVICE
DIAMETER WHERE
LEATHER BAND IS
SECURED TO
BAFFLE BOARD
8 7/16"
DIAMETER
AT BASE
OF CONE

PLAINTIFFS' HOPKINS DEVICE OF PATENT IN SUIT.



such utility as it may have in the radio loud speaker art was entirely fortuitous since that art was unthought of (at least by Hopkins) at the time of the alleged invention.

A Brief Comparison of the Device of the Patent and the Rola Loud Speaker:

On the accompanying page are illustrations showing the device of the patent and the Rola loud speaker. It is to be especially noted that Hopkins' structure is characterized by a relatively large, conical diaphragm, with a flat rim of the *same material as the conical portion,* the whole being termed a "tympanum" and required to be *greater than nine inches in diameter,* "if satisfactory regeneration of sound waves is to be obtained." The tympanum is required to be of "*crisp, strong material" throughout;* and this so-called "tympanum" is rigidly clamped at its rim by rings K and the whole is vibrated by means of a *stylus* attached to its apex, which in turn is actuated by the sound record of a *phonograph.* The flat rim of Hopkins' device gives off sounds and is an important element of the "tympanum".

The Rola loud speaker (Plaintiff's Exhibit 3) from which the illustration is made, employs a magnetic actuating unit for vibrating a relatively small, paper cone, said cone having a basal diameter of 7-9/16 inches. Fastened to the base of the cone is a band of limp *leather or "skiver"*, which in turn is secured to the surrounding frame. The over-all diameter within the inner edges of the frame is 8-7/16 inches. Around this frame is placed a "baffle-board", which prevents the sound waves given off at one side of the cone from setting up an interference with the sound waves from the opposite side of the cone. The leather rim in the Rola device gives off no appreciable sounds and is not a part of a "tympanum".[20]

[20] R. p. 68.

Indeed, the defendant's witness Jensen testified (R. p. 68) that if he were "speaking to a body of acoustical engineers, or electrical engineers, and tried to tell them that this was a tympanum, that soft leather kid, I think they would smile at me"; and that the purpose of the kid band is to hold the cone in position and also "to prevent the sound from the front part getting over to the back part of the cone" (R. p. 68).

Defendant's witness Tenny testified (R., p. 53):

> "Our kid membrane is a flexible resistive material, which to a greater extent insulates the edge of the cone from the supporting rim. When sound vibrations reach that flexible kid membrane, the softness and yielding qualities of it cause it to *absorb* a great proportion of that sound, * * * and prevent the bulk of that rattling."

When the Hopkins device, with its integral rim of stiff and vibratile material, is made of small size, it will produce rattling and blasting (R. pp. 52-53).

The witness Tenny testified that, to get satisfactory results from a Hopkins type cone, the diameter should approximate 18 to 20 inches, particularly in a radio loud speaker. This is borne out by Hopkins' admissions in the *Miller Brothers* case to the effect that he obtained his best results in a device having a diameter of 17 inches (see Record in Miller Bros. case, p. 282). The reason for this is that Hopkins never conceived of a baffle board, and, as stated by the witness Tenny (R., p. 53):

> "we found that a *baffle* of about three feet square insulates the back waves from the front waves, at all frequencies used in broadcasting * * *. However, we also found that a baffle three feet square was a *cumbersome and unwieldly piece of furniture,* and we

trimmed the size of that baffle down to the smallest we could get, which we finally adopted at 15½ inches."

The Issues:

The "sole" issue is not whether the "substitution of a narrower rim of more flexible material avoids the Hopkins patents" as alleged in plaintiff's brief (p. 5), nor is that the only difference between the device of the patent and that of the defendant, as the brief likewise alleges (p. 5). There are several material differences between the respective devices as before pointed out. There also are several issues as follows:

(a) Whether, so far as the rim is concerned, the teachings of the specifications that the rim is to be a part of the tympanum in the sense of a sound generator made of "vibratile", "crisp", "strong" material, may be disregarded and that any material which is used to connect the edge of the conical portion and the loud speaker support, but which is in no sense a sound generator or tympanum, is the equivalent of the rim described in the specifications.

(b) Whether a loud speaker such as the Rola, in which the cone is the only vibratile or sound producing element, and which is attached to a limp material, can be said to have a tympanum "rigidly supported at its periphery", or "its outer edge mounted on" a support or "secured" to such a support, as required in the claims of the patent.

(c) Whether a conical diaphragm, the sound generating portion or tympanum of which is materially less than 9 inches, infringes the patent.

(d) Whether the patent is not invalid, for reasons to be hereinafter discussed.

SUMMARY OF ARGUMENT.

1. The patent in suit is invalid because (a) the application on which it is based was not filed within the two years limited by Section 4897 R. S., and (b) because it is anticipated and lacks invention over the prior art.

The so-called three-element combination now claimed as the Hopkins invention was disclosed in many prior patents, and the fact that paper diaphragms of large area, both conical and flat, could be used to regenerate sound in free and unconfined air, was likewise disclosed in patents and publications prior to Hopkins.

(c) Moreover, claims 4 and 8 are invalid because of indefiniteness or as claims for a result, irrespective of size, unless they are restricted to cover tympana having diameters of 9 inches or more, as taught by the patent.

2. The construction which the Circuit Court of Appeals for the Third Circuit has given the patent in respect to the annular rim, is unjustified by the specifications, by the claims and by the Patent Office proceedings; and it is opposed to the weight of the American and English authorities; the same is also true if the decision be understood, as plaintiff contends, to hold that a tympanum the vibratile portion of which is less than 9 inches at its base, is covered by the patent. In addition, no English or American Court, outside of the Third Circuit, has adopted that view.

It is reasonably clear that the Circuit Court of Appeals for the Third Circuit held an annular rim not made of crisp, vibratile material to be within the scope of the patent, but it is by no means clear that the Court intended to hold that a tympanum having a basal diameter of less than 9 inches was covered by the patent.

3. The Rola loudspeaker does not infringe because it does not embody the "tympanum of novel construction" to which the teaching and scope of the Hopkins patent is limited:

(a) Fairly construed the Hopkins patent is limited to a unitary soundboard or tympanum, shaped into a cone portion and a plane peripheral portion of crisp, stiff, vibratile material throughout. Rola does not have it.

(b) Fairly construed the Hopkins patent is limited to a tympanum the vibratile portion of which is nine inches or more in diameter. Rola does not have it.

(c) Fairly construed the Hopkins patent is limited to a tympanum embodying a rim portion which is crisp, stiff and vibratile and therefore a part of the sound generator. Rola does not have it.

(d) Fairly construed the Hopkins patent is limited to a tympanum which is rigidly supported or mounted at its periphery. Rola does not have it.

4. Specific replies to, and comments on, some parts of petitioner's brief, viz: pages 12, 15, 21, 37, 38, 40-42, 59-60, 63 and 68.

ARGUMENT.

We will discuss the question of validity, and the decision of the Circuit Court of Appeals for the Third Circuit before the question of infringement, because the argument in respect to the latter can be more conveniently presented in that way.

I.

THE PATENT IN SUIT IS INVALID BECAUSE (A) THE APPLICATION ON WHICH IT IS BASED WAS NOT FILED WITHIN THE TWO YEARS LIMITED BY SECTION 4897 R. S., AND (B) BECAUSE IT IS ANTICIPATED AND LACKS INVENTION OVER THE PRIOR ART; AND (C) CLAIMS 4 AND 8 ARE INVALID FOR INDEFINITENESS OR AS CLAIMS FOR A RESULT, UNLESS THEY ARE RESTRICTED TO TYMPANA HAVING DIAMETERS EXCEEDING 9 INCHES.

It is urged in plaintiff's brief that because the Court below rested its decision on non-infringement, that the validity of the patent will not be considered in this Court. While it is true that in *Alice State Bank* v. *Houston Pasture Company,* 247 U. S. 240, it was said that this Court in that case would confine its "discussion to the matter relied upon in asking the intervention of this court", and in *Hubbard* v. *Tod,* 171 U. S. 474, that as the respondents did not apply for a certiorari, the Court would confine its consideration "to the examination of errors assigned by the petitioner", we respectfully submit that neither of those decisions are applicable to the case at bar. In the *Alice State Bank* case, the *petitioner* sought, after the case had been removed by certiorari, to advance grounds for reversal *other than the one upon which the writ was asked and granted.* In the *Hubbard* case, the Court below entered a decree to which the *respondents* in this Court *could have made some objection.* These cases but reiterate the rule which has long prevailed in the Federal Courts that an Appellate Court will not consider errors alleged to have been committed against an appellee, when the latter has not interposed a cross appeal. But in all those cases (many of which are collected in the opinion of the Circuit Court of Appeals for the Eighth Circuit in *O'Neill* v. *Wolcott Mining Company,* 174

Fed. 527, 535) the appellee *could* have interposed an appeal. In the case at bar, the decree of the District Court simply dismissed the bill,[21] and the decree of the Circuit Court of Appeals merely affirmed the decree of the District Court.[22] Moreover, both Courts found it unnecessary to pass upon the question of validity. *Consequently, the respondents could not have applied for a certiorari.* They could only seek in this Court a review of the *decree*, not of the *reasons* upon which the Courts based the decree.

As the whole case is before the Court, it is respectfully submitted that the question of the validity of the patent in suit should be determined by this Court, to the end that, if it is held invalid, all further litigation based on it will be at an end. *The public is, of course, vitally interested in whether or not this patent is valid.*

American Tube Works v. *Bridgewater Iron Company*, 132 Fed. 16, is directly in point. There a defence of license had been interposed in a patent suit and sustained. The Circuit Court entered "a decree dismissing the bill". The plaintiff then appealed to the Circuit Court of Appeals for the 1st Circuit. The opinion in the latter Court was written by Mr. Justice HOLMES, sitting as a Circuit Justice. He said [23]:

> *"The decree was general and therefore all defences are open here".*

Thereupon the Court considered the question of validity of the patent and held it to be invalid, and assigned that as one of the reasons for affirming the decree.

On the assumption that the Court will consider the question of validity, we will discuss the grounds upon

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[21] R. p. 20.
[22] R. p. 132.
[23] 132 Fed. at p. 17.

which we claim that the patent is invalid, in the order above stated.

(a) On the question as to whether the patent is invalid because the application was not filed within the two years limitation provided by Section 4897 R. S., we will rest on the argument presented in the brief of the petitioner in *Miller Brothers Company* v. *Lektophone Corporation*, which is to be heard immediately following the present case.

(b) We will now discuss the validity of the patent in the light of the prior art.

The Prior Art.

In view of the concessions made in petitioner's brief (p. 30) that many of the prior art patents show diaphragms for phonograph sound boxes consisting of a conical portion and an annular rim of flexible yielding material, the latter held rigidly at the periphery, (the three-element combination claimed by the petitioner to be the Hopkins invention), it will not be necessary for us to review all of the prior art which is in the record. We will, therefore, discuss one publication and only a few patents.

Conical Diaphragms Operating in Free Air, i. e., Without the Provision of Sound Box and Horn:

(a) *The Starling and Cole Article,* appearing in "Talking Machine News" of July, 1907 (R. p. 470). Therein is shown a paper conical diaphragm 8 inches in diameter with complete instructions for its manufacture and application to a phonograph. These inventors say in their article:

> "Our object in the first place was to produce a diaphragm which should be large and rigid enough

> to set sufficient air in vibration to produce audibility without the intervention of a trumpet; our paper cone must be looked upon as a modified diaphragm and not in any sense a trumpet. * * *
>
> Although our experiments have been made with the 'Perfecta' it would be easy to adapt the 'Vibratophone' to other styles of machines. We appear to have selected roughly good sizes of cone and tube, *still there is doubtless room for experiment in the selection of diameter and length.* Celluloid and cardboard have been tried for making the cone, but in our experience paper is by far the best material."

There has never been any question raised by plaintiff as to the operativeness of this device; and in fact, one of them was actually demonstrated to the court in *Lektophone* v. *Western Electric Co.*, 20 Fed. (2d) 150 (Lektophone Litigation, p. 25), with the following results, as stated in the opinion of Judge Thacher:

> "The Starling and Cole publication of 1907 disclosed a vibrating cone employed as a sounding board without sound box or horn. This extraordinarily simple home-made device, constructed of a cardboard mailing tube and a paper cone, was shown to have a purity of tone surprisingly good in the low frequencies, which are difficult to reproduce in a sound-box and horn combination. Volume was lacking, and when, to increase its volume, this device was driven with increased power, unwelcome buzzing and rattling sounds were heard, apparently caused by the shaking of the unsupported edges of the extremely light paper cone" (Lektophone Litigation, p. 28).

The "increased power" referred to by Judge Thacher was of course not a factor in the early days of the phonograph, nor in the days when Hopkins filed his applications. As Hopkins testified at R. p. 79:

> "The amount of energy which we had available was very small, compared with what is used ordinarily today."

The tendency to rattle or buzz at certain frequencies is termed "blasting" in the decision rendered by the Circuit Court of Appeals, Third Circuit, in the *Brandes* case, *supra*. This subject is nowhere mentioned in the Hopkins patents, and obviously is an afterthought devised by Hopkins' attorneys in an effort to distinguish over the *Starling and Cole publication* in respect to a condition which could not possibily have confronted Hopkins at the time he filed his applications.

In any event, the art had already taught in respect to smaller, conical diaphragms, the feature of restraining the base of the cone by means of some sort of a band or rim fastened to a rigid support or frame.

(b) *The Dann and Lapp patent 338,660, March 23, 1886*, R. page 470.

This early patent shows a conical diaphragm apparently three or four inches in diameter, exposed to free air and having a flat yielding rim secured to a rigid support. It is useful either as a telephone transmitter or receiver, since the principles of the one are applicable to the other. (Testimony of Tenny, R. p. 60.)

These inventors in their specification say:

> "The sheet-metal diaphragm A is constructed with a central conical portion, a, which may be formed integral therewith or made separately and attached by solder, brazing, or in any other suitable manner. The diameter of the base of the hollow cone may be varied considerably; but we prefer it shall equal and even slightly exceed that of the con-

> tiguous inner end of the mouthpiece B, of which it forms practically a conical extension." (R. p. 471.)

An actual test and demonstration was made at the trial, of a device constructed in accordance with this patent, which clearly showed that it was capable of producing self-sustaining sound waves in free air, the model being so constructed that the mouth-piece B could be applied or removed as desired.

Mr. Tenny at R. p. 59 related the results of this test and stated that when the horn or trumpet was removed it merely changed the directivity of the sounds but not their intensity.

Plaintiff's witness, Professor Hazeltine, who was present during the test, admitted at R. p. 99 that this Dann and Lapp structure employing a four-inch cone gave off "self-sustaining sound waves," without the aid of a horn or trumpet.

The Court will note that the Dann and Lapp device provides a yielding rim for the cone, which in turn is attached to the rigid structure B, so that if anything is lacking in the Starling and Cole paper cone in the way of a support for the rim, anyone skilled in the art could readily supply it from the teachings of the Dann and Lapp patent. It is also to be noted that the Dann and Lapp device has the three-element combination of the Hopkins patent, to-wit, the cone, the rim, and the rigid support. From the standpoint of similarity, the Dann and Lapp structure more nearly approaches defendant's device than does the Hopkins structure, in that Dann and Lapp have an electrically-actuated operating unit for the cone, whereas Hopkins has a mechanically-operated stylus; and moreover, the part B of Dann and Lapp functions as a baffle, which is a necessary adjunct to the Rola device, whereas no sug-

gestion whatever of a baffle is to be found in Hopkins' patents.

Concerning the Dann and Lapp patent, the Circuit Court of Appeals in the *Rola* case (34 F. (2d) 764) said:

> "The plane portion attached to a rigid structure, with a four inch central cone, *the device described in this patent was operated successfully at the trial to produce self-sustaining sound waves.*"

This patent and the evidence relating to it were not before the Circuit Court of Appeals for the 3rd Circuit in the *Brandes* case.

(c) *Maxwell patent 216,051*, June 3, 1879, R. p. 308:

This shows a conical diaphragm or tympanum of large size, the dimensions stated in the specification being from *seven to eight inches.* A device constructed in accordance with Fig. 1 thereof was actually demonstrated successfully at the trial in the District Court. (R. p. 59).

The Maxwell specification states:

> "I have found also by experiment that a vibrator that is from *seven to eight inches* in diameter through the center from one outer edge to the other is the most efficient, and that when they are much smaller than this the vibrations made by the vocal organs are of a nasal character; but when an apparatus of proper size is used at one end of the line, then a much smaller one may be used at the other without impairing perceptibly the effect." (R. p. 311.)

Here again we have the three-element combination of the Hopkins patent, the cone being represented at B, and the rim at A. This rim in turn is fastened to the rigid member forming the housing or box-like structure. Concerning

this patent the Circuit Court of Appeals, Ninth Circuit (34 F. (2d) 764,770) said:

> "These diaphragms are fastened to and upon the opposite side of a thin board of *soft pine or other vibrating material.* It is sufficient for our present purposes to note that the conical sheep skin diaphragm is only a part of the vibrating element, *the balance being the thin board to which it is attached.*
>
> An apparatus such as is described in the Maxwell patent, with a single cone, and another with two cones apex to apex, as therein described, were constructed and successfully operated as radio loud speakers at the trial." (R. pp. 123-124.) (Lektophone Litigation, p. 97.)

(d) *Lumiere Patents 986,477, March 14, 1911; and 1,036,529, August 20, 1912* (R. pp. 352 and 364, respectively):

The diaphragms of these patents are pleated, so that they assume what may be termed "a quasi-conical form." The rim is much more flexible than the apex or center, and the rim is rigidly held in place between the clamping rings.

The importance of these patents is that they enjoyed considerable commercial development in the early days, and as shown by the record (p. 41), 40,000 of these were manufactured and sold by the Victor Talking Machine Company.

One of these commercial devices is in evidence as Defendant's Exhibit 14. Mr. Tenny testified at page 47 that it was purchased in a store somewhere in Oakland, California, just prior to the trial, and that it had a Rola actuating unit.

It is stated in the Lumiere Patent 986,477:

> "I have found, however, that I am able to make a diaphragm according to the present invention, as large as *ten inches or more in diameter,* without impairing the quality of the reproduction, and by means of this diaphragm, I at the same time, attain a much greater volume of sound than with the smaller diaphragm. This amplification of the sound, I believe to be due, not only to the increased diameter of the diaphragm, but also to the increased surface area of the diaphragm produced in the construction above described, by the plaitings or crimpings or folds in the material of the diaphragm; this appears to have the effect of putting into motion a greater volume of air and so increasing the volume of sound.
>
> * * * * * * *
>
> The advantage arising from the use of a diaphragm constructed as above described, is that the volume of sound produced is sufficient to enable me *to dispense with the usual amplifying horn,* and in this way, much of the metallic and hollow character usually associated with talking machine reproduction is eliminated.
>
> Diaphragms may be made according to this invention, of any suitable elastic material, such as *paper,* (which may be varnished if desired), card, celluloid, metal, or the like, and the surface, or surfaces, of the diaphragm, or elements composing the vibrating body, may be put under tension by any suitable means." (R. pp. 357-358.)

The part marked "11" of *Patent 986,477* can not in any wise be considered as a horn. It serves a purpose similar to the baffle board or cabinet used in conjunction with defendant's loud speaker. It is described as follows in the Lumiere specification:

> "While I have shown a small trumpet 11 in connection with the constructions which I have illustrated, it is to be understood that the trumpet may be entirely dispensed with if desired, the function being to give direction to the sound waves rather than to increase the volume of the sound reproduced by the diaphragm" (R. p. 362).

So far as concerns the pleats in the Lumiere structure, they might well be disregarded in making a comparison with the disclosure of the Hopkins patents, since Hopkins in his specification suggests that his diaphragm might be benefited by impressing into it radial corrugations. Obviously, from the manufacturer's standpoint, such radial pleats or corrugations do not lend themselves readily to economy of construction, hence the explanation why the developments commercially have been along the line of a perfectly smooth cone. The Appellate Court in the *Rola* case (34 F. (2d) 764, 769) said concerning the Lumiere device:

> "While the appearance of the appellants' device is quite dissimilar from that of Lumiere the general principles of both would seem to be the same. Lumiere gets uniform vibration and large surface by tension and by fluting the paper diaphragm, and Hopkins gets both as does Starling and Cole by increasing the altitude of the cone. * * * The pleating gives strength in the direction of the application of the vibrations, which is achieved by Hopkins by greater altitude of the cone. The Victor Talking Machine Company manufactured and sold about 40,000 of these Lumiere diaphragms. In the above quotations from Hopkins' patent it will be observed that he speaks of a corrugated cone, and he might with equal accuracy have referred to a fluted cone as the equivalent of his uniform surface cone.

The Lumiere device presents the idea of a diaphragm of large surface generating a self propagating sound wave, attached to a rigid frame. This device was operated at the trial as a radio loud speaker." (Lektophone Litigation, p. 96.)

(e) *French patent to Ader, 127,180, October 28, 1878* (R. p. 465):

This patent discloses a diaphragm of large diameter fastened at its rim somewhat after the manner of a banjo-head, and it is vibrated by means of an electrically actuated unit. The specification states:

"A diaphragm of large surface of about 40 centimeters in diameter gives strong sounds but a little confused; a diaphragm of smaller diameter, about 3, 4 or 5 centimeters gives very distinct sounds but less strong; the average diaphragms of *10 to 20 centimeters diameter* are those which operate the best" (R. p. 467).

Small Conical Diaphragms with Yielding or Flexible Rims Rigidly Held at the Periphery:

(f) *Edison 963,362, July 5, 1910* (R. p. 345):

This shows in Figure 2 especially, a conical diaphragm having a *yielding* peripheral portion secured to the supporting frame 13. In his specification Mr. Edison says:

"Since the diaphragm can vibrate only to and fro as a rigid body, like a piston, any yielding is necessarily confined to and takes place entirely within the small free portion of the ring 2, extending between the diaphragm and the cement which holds the ring in place. *This yielding section* can have no audible local disturbing tone; and hence, all of its

> movements, as well as those of the diaphragm, are forced, and the recorder is, therefore, caused to accurately follow the sound waves" (R. p. 349).

The "ring 2" which Edison states can have "*no audible local disturbing action*" is said in the specifications to be preferably of "*soft rubber*" and acts "*as a hinge*" (R. p. 348).

In this connection, it will be remembered that Hopkins was working for Edison, and, presumably, there was available to him not only this patent, but the result of all of Edison's experiments which led up to it.

(g) *Johnson, 1,180,401, patented April 25, 1916,* on an application filed *February 16, 1912* (R. p. 394):

This likewise shows a rigid, conical diaphragm with a rim of a flexible material, said rim being intended to be secured to a rigid support of the open or enclosed type and *with or without a horn.* The inventor says:

> "Generally stated, the form of this invention hereinafter described provides a flat, annular, *vibratory flange,* to which is secured a bulged or *conical* substantially inflexible major portion adapted to reciprocate as a whole within the engaged peripheral edge of said annular flange." (R. p. 395.)

The Johnson patent is directly in point. The object of the invention is stated therein as follows (R. p. 394):

> "The principal object of this invention is, to provide a diaphragm that will readily respond to the most delicate and rapid vibrations, and accurately record and reproduce all of the high and low tones and the included range with equal clearness and with substantially *the same intensity as the original sounds.*"

This clearly is an exposition of the theory which Mr. Hopkins is advancing *at the present time* in connection with the device of his patent, and illustrates the fact that the mode of operation of the small conical diaphragm mounted within a sound-box is the same as that claimed for the Hopkins device, and that the results attained differ only in degree, if at all, from those of the larger cones employing no horns or sound-boxes.

The Johnson patent shows a diaphragm with a conical portion 50 (fig. 22) and an annular portion 30 surrounding the base of the conical portion of "sheet material, such as mica, isinglass, celluloid, paper, and similar materials." The annular portion is formed separately from the conical portion but the two are secured together by an intermediate thin membrane 52. The annular portion is intended to be mounted in a sound box *but the character of the sound box is not mentioned nor is any mention made as to the size of the diaphragm or that it is intended to be used with a horn.* The character of the sound box in which the Johnson diaphragm is used might well be one "*of ten inches or more in diameter*", such as shown in the Lumiere Patents Nos. 986,477 and 1,036,529, comprising radial arms 13 and clamping rings 9 and 10. Such a structure may properly be termed a sound box, and in fact Lumiere throughout his patent refers to it as a sound box. See, for example, R. 364, and Claims 2, 5 (R. p. 374) and 26 to 30 (R. pp. 377 and 378, respectively) of Lumiere No. 1,036,529. No ingenuity whatever would be required to mount the Johnson diaphragm in the Lumiere *open type hornless sound box*, and such transfer would meet the Hopkins asserted combination in every respect except that in Hopkins the annular rim is *integral* with the conical portion, whereas in Johnson the annular rim is separately formed but adhesively attached to the conical portion *just as in defendant's device.* Claim 4 of Johnson precisely describes defendant's conical diaphragm and annulus.

(h) *Stroh, British Patent No. 3393, of 1901* (R. p. 428):

Stroh shows and describes a conical diaphragm with a flat or corrugated rim held in place between rigid clamping rings.

The inventor thus describes the device:

> "The present invention has for its object, to increase the efficiency and uniformity of the vibrations, and thereby to increase the quality of the sounds, or the accuracy of their reproduction. For this purpose I make the centre of the diaphragm rigid by giving it the *shape of a cone* having its apex at the point where vibrations are imparted to the diaphragm or transmitted by the same, while the annular portion between the base of the cone and the edge of the diaphragm may be flat or corrugated, the number and depth of the corrugations depending on the nature of the diaphragm and on the effect desired. When the vibrations are imparted to the diaphragm from the centre, the conical part will move up and down *as a whole,* without materially altering its shape, while the corrugated part *yields* to each movement of the cone, and as the cone occupies preferably about *two-thirds* of the diameter of the diaphragm, *a larger stratum of air* will be set in motion, or the vibrations will be more uniform than in the case of a flat diaphragm. The concentric corrugations of the rim facilitate the motion of the cone in the direction of its axis, while *preventing or impeding vibrations* in any other direction, which accidental or irregular vibrations are supposed to be the *cause of impure sounds.* The diaphragm may be made of metal, ebonite, celluloid, or other suitable material, and the most suitable thickness should be ascertained by experiments." (R. p. 429.)

It will be noted that this diaphragm was intended to be used not alone with the small sound-boxes of phonographs,

but in connection with violins or other stringed instruments, such as shown in the earlier *Stroh patent, British 9418 of 1899* (R. p. 423), and that a complete disclosure is made as to how to move the cone bodily and at the same time prevent or impede any other vibrations at the rim which would be the cause of peculiar sounds such as the weaving or blasting effect which has been attributed to the Starling and Cole device.

The record shows that the Stroh diaphragm was commercially developed in connection with a violin fitted with a trumpet, or directional baffle. The witness Sooy at R. p. 44 testified that during the years 1903 and 1904 they were used commercially by Victor Company for making records of violin music. One of these devices is in evidence as Plaintiff's Exhibit 33.

(i) *Brown, U. S. 1,096,676, May 12, 1914*, filed March 27, 1911 (R. p. 387) and corresponding *British Patent, 29,833, December 22, 1910.*

This shows a magnetically actuated conical diaphragm having a flat rim portion secured to a supporting casing. The inventor says:

> "The diaphragm is so arranged as to be free to *move as a whole,* that is to say all points on its surface vibrate equally, and to insure this action the periphery of the diaphragm is either quite free or is attached to the usual casing by a mere thin ring of *flexible material.*" (R. p. 390.)

Here again we are not dealing with a mere paper patent. Brown's devices were placed upon the market extensively,

being referred to by plaintiff's witness Farrand at R. p. 102, as something that had been on the market for a number of years.

It is also important to note that the Brown specification says:

> "Where it is desired to make the sounds travel out into the room, *a receiver of larger size is preferable.*" (R. p. 390.)

Concerning the Brown patent the Circuit Court of Appeals in the *Rola* case (34 F. (2d) 764, 771), said:

> "So far as the case at bar is concerned, the notable teachings of the Brown patent are (1) a light conical diaphragm, (2) connected at its apex with the stylus or source of vibratory power, (3) connected by a plane annulus with a stationary ring or side of the device, (4) permitting the cone to vibrate as freely as possible in the direction of its axis, (5) the ring to act as a buffer between the waves generated by the front and back portions of the conical diaphragm, (6) that the cone be of extremely light material. It differs most notably in size from the devices of the parties hereto, but its function is the same—to reproduce sound—and as has been pointed out it differs in the material of the annulus. The *notable feature of this patent so far as the case at bar is concerned is the emphasis placed by the inventor, upon the annulus connection of the diaphragm and its function.* The cone was not new in the art, neither was the idea of the cone connected at the periphery of its base by a resilient 'flange.' Brown's effort was to decrease the weight of the cone and to decrease the resistance of the flange or rim to the free vibrations of the cone." (Lektophone Litigation, p. 100.)

Anticipation and Lack of Invention:

It thus appears from the foregoing that *conical diaphragms*—tympana—made of "crisp", "strong", "light", "vibratile" material, with *yielding* or flexible annular rims rigidly supported at the periphery, were old in sound boxes and telephone receivers and transmitters and, in the latter, were used in *free and unconfined air.* The use of a *large paper* cone of approximately the same diameter at its base as the patent specifies, was old as a diaphragm for a phonograph.[24] Diaphragms, acting as loud speakers in free and unconfined air, made of paper as well as other materials, and of large area (exceeding that specified in the patent) with their edges rigidly held were likewise old.[25] Even in the old mechanical telephone art, Maxwell taught the same thing.

How then did it involve invention to merely increase the size of the conical diaphragms with the flexible annular rims of the telephone and sound box art to the size which the other patents and publications had taught was necessary for a diaphragm which was to be used in connection with a phonograph in free and unconfined air. It will be borne in mind that the device of the patent in suit was designed for use with a phonograph.

It is apparent that the argument of plaintiff that there is anything patentable in supplying a yielding rim for a large size conical diaphragm and then mounting this yielding rim in a rigid frame or support to afford a "three-element combination" is unsound. From the prior art that has been cited here, the veriest tyro would instantly see that a cone will not readily flex since it is built like an arch, and, therefore, if it is to move at all, which it must in order

[24] Starling & Cole, R. p. 470.
[25] Ader and Lumiere, R. pp. 465, 352.

to set up sound vibrations, there must be an allowance for such movement by way of a yielding rim. Early phonograph experimenters like Edison, Johnson, English, *et al.*, taught this very clearly and provided yielding rims and rigid supports therefor. Since there must be a movement of a diaphragm to set up sound waves, there is no other way to accomplish this with an inflexible conical diaphragm, except by a certain lack of restraint in the bodily movement of the cone supplied by a yielding rim, and such a rim can yield only if and when anchored in a rigid frame or support.

It did not require the suggestions of an itinerant patent solicitor like Hopkins to inform the acoustic art that the larger the diaphragm and the greater the power that is actuating the diaphragm, the louder will be the sounds.

Obviously, to borrow a feature from one branch of the art and apply it to the other is not invention.

Rather it is what this Court has frequently designated "is but the display of the expected skill of the calling."

> *Hollister* v. *Benedict*, 113 U. S. 59;
> *Vandenburgh* v. *Trucson Steel Co.*, 261 U. S. 6;
> *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177.

The contention of plaintiff that the principles of construction employed in connection with these so-called "sound-box and horn" type of receivers are not applicable to the larger types of diaphragm not using a sound-box or horn, is not supported by the evidence. *All are acoustic devices or sound-regenerating machines, and the principles of one apply to the other.*

Judge Hickenlooper considered this question in *Lektophone* v. *Crosley* (Lektophone Litigation, p. 61) (not reported), as follows:

> "The arts of sound box and amplifying horn, on the one hand, and of sounding boards or diaphragms operating in unconfined air, on the other, cannot be considered as wholly independent and distinct of each other. Both lie in the domain of acoustics and both involve the same principles of reproduction of pure sound. It is the vibration of the diaphragm in each which produces the sound waves and diaphragms of larger dimension may be constructed with sound box and amplifying horn or those of smaller dimension operated in unconfined free air with smaller volume of sound, it is true, but with good quality. Telephone receiving instruments, while classified by counsel as in the sound box art, operate upon unconfined air in an acoustic sense. In the case of both the same fundamental principles apply" ("Lektophone Litigation," p. 65).

It will be borne in mind that the Hopkins patent was not the result of any effort to supply a need to the radio art, but it has been brought over from the phonograph art in an effort to dominate the radio art. Because of the character of his work, and the time the alleged invention was made, he could not have hoped to supply any demand for anything needed in the radio art. Therefore, no finding of invention can be predicated on the idea that Hopkins solved a problem in the radio art, which was demanding solution, namely, a loud speaker other than the sound box and horn. In addition, the sound box and horn is still retained in the Victor Talking Machine today.[26]

The statement in petitioner's brief (p. 16) that by Hopkins' so-called three-element combination there was attained "an object which had engaged the attention of inventors and patentees for many years", is not supported by the evidence. On the contrary, as before shown, the so-called

[26] R. pp. 40-43.

three-element combination diaphragm for regenerating sound was old. In its old environment, it operated in the same way and produced the same result as is claimed for the Hopkins device. All the elements in the old art performed *in combination* exactly the same function as it is claimed they perform in Hopkins.

Nor can invention be found in this case from commercial success.

Several loud speaker manufacturers took licenses under the Lektophone Company patents, in which were included the Hopkins patents. Some of these concerns became licensees only after suits were filed against them. The testimony on this point given by plaintiff's witness, Mr. Farrand, at R. p. 129, shows that some thirty suits for infringement had been filed prior to the trial of this case (R. p. 87). The Court of Appeals in this case very properly pointed out (34 F. (2d) 764, 772):

> "The appellant has never manufactured a radio loud speaker. The first radio loud speaker of the cone type was made in 1921 by Mr. Ferrand, a licensee of the appellant, and now a stockholder in the appellant corporation, 'after several years experiment.' If the Hopkins patent was a basic and generic patent, on the form and use of a large diaphragm or soundingboard to produce self-sustaining sound waves, this great production would be strong evidence of its utility, and consequently of his invention, but the evidence here simply indicates that the appellant has been remarkably successful in levying tribute upon a new and rapidly extending art. He has succeeded in asserting a monopoly in a new field, not in contemplation at all by the patentee when he made his invention. We cannot see that this success is as persuasive as such evidence sometimes is, as to the exercise of the inventive faculty. *The appellant*

> *has been active in asserting its alleged monopoly, and has thus, no doubt, forced many to buy their peace in a situation so full of doubt, confronted by such dire penalties, as are involved in unsuccessful patent litigation.''* (R. p. 130.) (Lektophone Litigation, pp. 104-105.)

It is important to note that no device corresponding even remotely to Hopkins' disclosure has ever been manufactured commercially and no model thereof has been offered in evidence by the plaintiff.

Thus, the patentee Hopkins testified:

> "Q. And the Lektophone Corporation never did any actual manufacture, either of phonographs or loudspeakers, did it?
>
> A. No, I think it confined its efforts to experiments." (R. pp. 77-78.)

(c) Claims 4 and 8 are Void for Indefiniteness and as Claims for a Result:

(a) These two claims come precisely within the rule and condemnation applied by this Court in *Minerals Separation* v. *Hyde,* 242 U. S. 261. In that case certain of the claims called for the use of an oil amounting to "a fraction of 1% on the ore," while other of the claims called for a "small quantity of oil." The Supreme Court, while finding the former group of claims valid, found the latter group invalid, saying (p. 271):

> "While we thus find in favor of the validity of the patent, we cannot agree with the District Court in regarding it valid as to all of the claims in suit. As we have pointed out in this opinion, there were many investigators at work in this field to which the process in suit relates when the patentees came into it;

> and it was while engaged in study of prior kindred processes that their discovery was made. While the evidence in the case makes it clear that they discovered the final step which converted experiment into solution, 'turned failure into success', (*The Barbed Wire Patent* [Washburn & M. Mfg. Co. v. Beat Em All Barbed Wire Co.], 143 U. S. 275, 36 L. ed. 154, 12 Sup. Ct. Rep. 443, 450), yet the investigations preceding were so informing that this final step was not a long one, and the patent must be confined to the results obtained by the use of oil within the proportions often described in the testimony and in the claims of the patent as 'critical proportions,' 'amounting to a fraction of 1 per cent on the ore,' and therefore the decree of this court will be that the patent is valid as to claims Nos. 1, 2, 3, 5, 6, 7, and 12, and that the defendant infringed these claims, but that it is invalid as to claims 9, 10, and 11."

Plaintiff attempts to distinguish this case from the present case by arguing that in the *Minerals Separation* case "the new mode of operation and effect did not begin until the oil had been reduced to at least a fraction of 1% on the ore." However, the same patent was subsequently before this Court in *Minerals Separation* v. *Butte*, 250 U. S. 336. A reading of the trial court's opinion in that case (245 Fed. 577) shows clearly that the mode of operation and effect, to wit, "frothing", took place when percentages of oil *greater* than 1% were used. Therefore the trial court found infringement.

Notwithstanding this fact, the Supreme Court in the *Butte* held as a matter of law that it was necessary to place a definite and fixed limitation on the claims in the light of the specification, and that the broad interpretation contended for by plaintiff should be rejected, for the following reasons:

> "To give such a construction to the patent would subordinate the clear description contained in it of what are oils of the process, *to an implied and vague description* and classification which would leave the whole subject again at large, to become a field for further experimentation, without definition in the patent of what oils or froths would satisfy it. So interpreted the patent could not reasonably be said to contain a disclosure of the discovered process in the 'full, clear, concise, and exact terms' required by law (Rev. Stat. Sec. 4888, Comp. Stat. 1916, Sec. 9432, 7 Fed. Stat. Anno. 2d ed. p. 145), and the claims might conceivably be said to fall short of 'particularly point out and distinctly claiming' any discovery at all within the meaning of the act of Congress." (250 U. S. 350.)

Section 4888 R. S. requires that the patentee

> "point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery."

It is a settled rule of law that claims which are ambiguous and uncertain in their meaning are invalid.

> *Carlton* v. *Bokee,* 84 U. S. 463;
> *Marchand* v. *Emden,* 132 U. S. 195;
> *Merrill* v. *Yeomans,* 94 U. S. 568.

(b) The expression in Claim 4 (R. p. 140),

> "the tympanum being of sufficient area to impart to the surrounding free air, when vibrated, sound waves substantially corresponding in intensity to the original sound waves,"

obviously has no meaning in connection with a radio loud speaker where vacuum tube amplifiers are employed and the faintest signal can be reproduced with extreme loudness.

Likewise, the expression in Claim 8 (R. p. 141),

> "being of sufficient area to produce self-sustaining sound waves in the surrounding air when vibrated"

has no significance in connection with loud speakers where amplifiers are used. Defendant's witnesses concede this. (Hazeltine, R. p. 100; Farrand, R. p. 82; and Hopkins, R. p. 80.)

That claims for a function or result are invalid has been emphasized recently by this court in *Holland Furniture Co.* v. *Perkins Glue Co.*, 277 U. S. 245, 257.

Therein the Court holds that a patentee whose specification disclosed a particular mode of treatment of a specified starchy material whereby a glue similar to animal glue is produced, even though he be the first to accomplish that result, could not legally claim any and all starch glues having the functions or properties of an animal glue, for the reason that:

> "A claim so broad, if allowed, would operate to enable the inventor who has discovered that a defined type of starch answers the required purpose to exclude others from all other types of starch and so foreclose efforts to discover other and better types. The patent monopoly would thus be extended beyond the discovery and would discourage rather than promote invention. *The Incandescent Lamp Patent, supra* (159 U. S. 465) 476. *That the patentee may not by claiming a patent on the result or function of a machine extend his patent to devices or mechanisms not described in the patent is well understood*" (citing many Supreme Court cases).

This is exactly what the plaintiff is attempting to do through its interpretation of claims 4 and 8. It would have this court construe those claims as though they were dis-

associated from the specification and were unlimited as to the size, material, construction or actuating force of the tympanum so long as its function or result is to reproduce self sustaining sound waves or sound waves corresponding in intensity to the original sound waves.

In claims 4 and 8 an attempt is made to claim a conical tympanum, without regard to size, which tympanum will reproduce self-sustaining sound-waves, or sound-waves corresponding in intensity to the original sound-waves, without reference to the particular form of actuating force. This is but an attempt to claim a function or result and to cover a new industry which according to the admissions of Hopkins he was not "sufficient of a prophet to foresee" (R. p. 78).

II.

THE CONSTRUCTION WHICH THE CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT HAS GIVEN THE PATENT IN RESPECT TO THE ANNULAR RIM, IS UNJUSTIFIED BY THE SPECIFICATIONS, BY THE CLAIMS AND BY THE PATENT OFFICE PROCEEDINGS; AND IT IS OPPOSED TO THE WEIGHT OF THE AMERICAN AND ENGLISH AUTHORITIES; THE SAME IS ALSO TRUE IF THE DECISION BE UNDERSTOOD, AS PLAINTIFF CONTENDS, TO HOLD THAT A TYMPANUM, THE VIBRATILE PORTION OF WHICH IS LESS THAN 9 INCHES AT ITS BASE, IS COVERED BY THE PATENT. IN ADDITION, NO ENGLISH OR AMERICAN COURT, OUTSIDE OF THE THIRD CIRCUIT, HAS ADOPTED THAT VIEW.

The plaintiff contends that the decision of the Circuit Court of Appeals for the Third Circuit brings within the scope of the patent not only any device with any kind of a flexible connecting means between the cone and the loud speaker support, irrespective of whether it is of "crisp," "vibratile material" and a part of the tympanum or not,

but also devices having tympana of less than 9 inches at their base, providing that they are of relatively large area compared with those used in sound boxes. As we will point out directly, we do not think that it was ever intended by the Circuit Court of Appeals for the Third Circuit to accede to this latter proposition.

(a) A reading of the opinion of Judge Buffington shows that the Circuit Court of Appeals for the Third Circuit was principally concerned with the question of *validity,* and gave very little attention to infringement. The only art discussed in his opinion is Lumiere and Starling & Cole. As to the latter, the statement is made in the opinion that, while they showed a conical shaped sounding board, it was "of such smaller size that it was considered *a mere plaything.*" Far from being so small that it was considered a mere plaything, the article shows that the cone was to have, as a rough estimate, a base of at least 8 inches, *only one inch less than that of Hopkins.*

Again the Court, in *Brandes* case, said:

> "Now it seems to us that Hopkins was the first to point out that this blasting effect, caused by the local vibrations at the edge of the cone, would be prevented and the cone held restricted to vibrations as a whole, and the weaving prevented, by the expedient of using a rigid frame and making a liaison between the edges of the cone and the clamp of the rigid frame by a flexible yielding liaison belt, which vented and thereby prevented the obnoxious fluttering of a cone's edges not rigidly held."

Nowhere in the Hopkins specifications is any reference made to weaving or blasting of the edges of the cone, and nowhere is any reference made to the "flexible yielding liaison belt." What Hopkins shows and described is a so-called "tympanum"

> "of crisp, strong material, having considerable rigidity within itself" (R. p. 138);

and that

> "If satisfactory regeneration of sounds * * * is to be had, the whole diameter of the tympanum * * * should exceed nine inches" (R. p. 137).

Obviously, the "tympanum" includes the so-called "plane peripheral portion", for the Hopkins specification says:

> "A tympanum L, of *light, vibratile* material has an annular plane peripheral portion l, the outer edge of which peripheral portion or supporting rim l is tightly gripped and rigidly supported between the ponderous rings K and K′, and a central conical portion l′ rising from the inner edge of the annular plane peripheral portion" (R. p. 146).

Moreover, there is no justification under the present record for crediting Hopkins with any discovery of a "flexible, yielding liaison belt," or any new theory as to "blasting." The prior art as presented here makes any such conclusion impossible. As pointed out by Judge Hickenlooper in the *Crosley* case:[27]

> "Even if the Hopkins patent can be read as teaching that the base of the cone must be restrained against weaving, fluttering or forming loops and nodes, in order to produce a satisfactory result, Hopkins was not the first to so teach. This teaching is clearly disclosed by Stroh (British Patent No. 3,392—1901) and the practice of so restraining the base of the conical portion of the diaphragm was employed and the subject of patent publication by English, Brown and others, including Lumiere, without de-

[27] Lektophone Litigation, p. 68.

> tailed reference to the function of such annulus or plane rim. We cannot concur in the apparent opinion of the Court of Appeals of the Third Circuit (Brandes Case) that 'Hopkins was the first to point out that this blasting effect, caused by local vibrations at the edge of the cone, would be prevented and the cone restricted to vibrations as a whole, and weaving prevented by the expedient of using a rigid frame and making the liaison between the edges of the cone and the clamp of the rigid frame by a flexible yielding liaison belt.' Stroh specifically taught this but not Hopkins."

Dann and Lapp was not before Judge Hickenlooper, and it was not before the Circuit Court of Appeals for the 3rd Circuit.

The Court of Appeals, for the Third Circuit, also makes the assertion that the Lumiere Patents attained no position in the practical art.

The record in the present case shows that some 40,000 of these Lumiere devices were actually manufactured and sold by the Victor Company[28] up to the time that the witness McEwan testified, several years ago. The record also shows that the Lumiere device was being manufactured in France as early as 1908 or 1909.[29]

Neither does the opinion of Judge Buffington show that the Circuit Court of Appeals for the Third Circuit took any note of the statements in the specifications of the patent that the *tympanum,* which is the subject matter of every claim of the patent, was to be "rigidly supported at its periphery", and was to be constructed of "light, vibratile material",[30] or, as is otherwise expressed in the specifications "it is of vital importance that the *tympanum* be made

[28] R. p. 41.
[29] R. p. 37.
[30] R. p. 137.

of crisp, strong material having considerable rigidity within itself".[31] That Court was satisfied, apparently, that the rubber band which the plaintiff claimed was the annular rim of the patent, should prevent "weaving and fluttering of the outer edges of the sounding board". But, as before shown, that function of the annular rim of the patent is nowhere referred to in the patent and was disclosed in many prior patents.

It is apparent from a reading of the patent that the annular rim is to be a part of the tympanum, in the sense that it is to vibrate with the conical part and to create sound. It was expressly so held in the *British* case.[32] This feature is entirely overlooked in Judge Buffington's opinion.

It thus appears that the Court of Appeals for the Third Circuit, in its construction of the patent in suit, has acted on erroneous premises and has overlooked the express teachings of the patent as to the character of the material of which the annular rim is to be made and one of its functions.

One of the essential characteristics which the patentee represented to the Patent Office was of the *essence* of his invention, namely, the dimensions of the tympanum, is passed over by the Court, with the statement

> "While the form of the Hopkins circular cone is not precisely duplicated by defendant's elongated oval cone, yet in *area* and sound function is appropriated and reproduced."

In the *Brandes* case there were two loudspeakers which it was claimed infringed. The testimony in this case shows

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[31] It is argued in petitioner's brief that when the patentee used the last above quoted words, he referred only to the conical portion. But that is opposed to the above quoted patent definition of the "tympanum". This will be more fully described in the part of this brief which is devoted to a discussion of the question of infringement.

[32] Lektophone Litigation, p. 201.

that one of the Brandes diaphragms had an overall diameter of 8⅞", the conical portion of which was 7-15/16". The other one had an overall diameter greater than 9". The question of size apparently was not urged in that case, owing, doubtless, to the fact that it was a defense only as to a part of defendant's manufacture, and consequently, little, if any, note was taken of it by the Court of Appeals.

That Court has treated the patent as a pioneer entitled to a wide range of equivalents and has accepted, as the true measure of Hopkins' contribution, not what the patent taught, but what counsel, in the light of the prior art, has attempted to attribute to the patent.

How can it possibly be held that Hopkins stands in the position of a pioneer, when every element of his so-called three-element combination was old *in combination*, and when the prior art taught in addition that if sounds were to be regenerated in free air without the use of a sound box, a large diaphragm of from 8 to 10 or more inches was desirable?

(b) With the possible exception of the early decision of Judge Campbell in the *Sylo* case (which was reversed) and the recent decision of Judge Galston in the Eastern District of New York, *Lektophone* v. *Colonial Radio Corporation* [33] and the Courts in the Third Circuit, which have followed the Circuit Court of Appeals of that Circuit, every other Court has refused to give the patent in suit any such breadth of construction as the plaintiff contends for; but, on the other hand, have held it to be *restricted* by its specifications, claims, patent office proceedings, and the prior art.

In considering the decisions of Judge Campbell and Judge Galston, it must be borne in mind that the conical

[33] Lektophone Litigation, p. 112.

part of the loud speaker which was before the Court in the *Sylo* case had a diameter at its base in excess of 9", and although the character of the device before Judge Galston in the *Colonial* case is not in evidence, it was apparently of greater diameter than 9", inasmuch the Court found infringement as to all claims, including those which specifically require that the diameter between the rings be greater than 9". These cases, therefore, cannot be considered as authority for the proposition that a loud speaker with a diameter at its base of less than 9" infringes the patent.

In the *Western Electric* case,[34] Judge Thacher said:

> "As I read the claims they were intended to confine the patent to a 'tympanum of novel construction,' and the limitations, therefore, were inserted to *define and limit* the particular *form of construction covered by the patent.* This was necessary in view of the prior art, which disclosed various forms of similar devices upon which the patented device could be regarded at best as only an improvement, and only so because of the method devised for supporting the edges of the vibrating cone by means of a flexible annular rim. Even this device, thus supported, was not novel in sound-box construction, and, therefore, it seems to me *that the patentee is not entitled to a range of equivalents which will prevent others from accomplishing what he accomplished by means other than those expressly covered by his claims, limited as they are to a particular form of mechanical structure".*

When this case came to the Circuit Court of Appeals, Judge Manton, speaking for that Court, said:[35]

> "The appellant's specified way of accomplishing its results, as stated in the claims, left open oppor-

[34] Lektophone Litigation, p. 34.
[35] Lektophone Litigation, p. 41.

tunity for subsequent improvers to freely accomplish the general results *by different means.*"

In the *Crosley* case, Judge Hickenlooper, in a well-considered opinion, where the prior art is fully examined, said:[36]

> "*The form, shape, size, material and proportions were all of the very essence of his invention. The necessity of restricting the edge or base of the cone against deformity was not of the essence because it was old.* The details of shape and dimensions pertained especially to the inventive step rather than to mere environment, were so considered by the patentee and so precisely claimed. *To the size, shape and proportions thus disclosed the patentee is limited by the prior art and the very essence of his invention.*"

He further said:[37]

> "We therefore hold that by the prior art, by the claims as drawn, by the essence and exact nature of the invention as disclosed, and by the estoppel created in the Patent Office proceedings, the patentee here is limited to a diaphragm having the annular rim, *rigidly held, and to a comparatively narrow range of equivalents.*"

This case is now in the Circuit Court of Appeals awaiting decision.

In the British case, Mr. Justice Tomlin said:[38]

> "*Further, in my opinion the inventor is treating the whole of the diaphragm or tympanum as the sound producing body. The tympanum as a whole, that is to say, including both its conical part and its*

[36] Lektophone Litigation, pp. 68-69.
[37] Lektophone Litigation, p. 71.
[38] Lektophone Litigation, p. 201.

annular part, is to have a diameter exceeding 9 inches, and is to be *light and have* the minimum of inertia consistent with *the necessary rigidity.* The phrase, 'the conical active portion of the tympanum' does not, in my judgment, imply that the cone is the sole sound producing medium, but only indicates that it is through the cone that the vibrations are actively conveyed to the tympanum as a whole. The inventor is treating a plane surfaced diaphragm as the ideal, and is seeking a compromise by coning only so much of it as is necessary to give him the rigidity required, and he suggests a suitable proportion between conical and annular parts.

The conical and annular parts are, I think, *to be of one and the same material,* and of such stiffness and *area that the annular portion when 'tightly gripped' at its outer edge by the ponderous rings will be sufficiently rigid to support the diaphragm or tympanum as a whole,* and sufficiently flexible and springy at once to permit and take up the vibrations of the cone to resist the displacement of the cone in the degree necessary to maintain its form and to enable it to return to its normal position after the cesser of the vibrations."

He further said:[39]

"Now I am satisfied upon the evidence that it makes no substantial difference to the functioning of the Mascot cone whether the ring of thin paper is round the edge of the cone or not. That ring of paper operates to cut off the air between the back and front and to afford some slight protection to the cone when the instrument is being handled or moved. It does not in my judgment either mechanically or functionally correspond with the annulus in Hopkins. The diaphragm in the Mascot is the cone and the cone alone, and *the edges of the cone are not clamped,*

[39] Lektophone Litigation, p. 211.

> and such constraint as is exercised on those edges by the thin paper ring is negligible. Whatever be the true construction of the specification of the patent in suit, I think that there is no infringement by the Mascot."

Of course, the opinions of the courts below, in the case at bar, give to the patent the same narrow construction that other courts have given to it. Judge Wilbur, speaking for the Court of Appeals, concluded his opinion as follows:[40]

> "We must either hold that the appellant's device is void for lack of invention or that he is so narrowly confined by the specified dimensions and claims of his patent that the smaller device of the appellee, with its limp leather annulus, does not infringe. It is sufficient for the purpose of this case to follow the latter course, as the trial judge did."

A reading of the opinions of Judge Bourquin and Judge Wilbur in the case at bar will demonstrate, we think, that these courts reached their conclusions by a careful consideration of the prior art and the limitations imposed by the specifications, claims, and patent office proceedings of the patent in suit, factors which the Appellate Court in the *Brandes* case apparently overlooked, or about which it was not sufficiently informed.

In *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 63, *a case relied upon by plaintiff*, Mr. Chief Justice Taft, in delivering the opinion of the Court said:

> "In administering the patent law the court first looks into the art to find what the real merit of the alleged discovery or invention is, and whether it has advanced the art substantially. If it has done so,

[40] Lektophone Litigation, p. 107.

> then the court is liberal in its construction of the patent, to secure to the inventor the reward he deserves. *If what he has done works only a slight step forward, and that which he says is a discovery is on the border line between mere mechanical change and real invention,* then his patent, if sustained, will be given a *narrow* scope, and *infringement will be found only in approximate copies of the new device.*"

We submit that the Courts in the case at bar, have adhered to this rule far more faithfully than did the Circuit Court of Appeals for the Third Circuit.

III.

THE ROLA LOUD SPEAKER DOES NOT INFRINGE.

Preliminarily to the discussion of infringement we would direct the Court's attention to two circumstances that cannot be overlooked: (a) the fact that the patent in suit deals with problems peculiar to phonographs; and (b) that Hopkins entered a field of sound reproduction which was already crowded, and his invention, if any, therefore, was of a minor degree.

As was said by Mr. Justice Tomlin in the *British* case:

> "In 1913, at the date of the patent in suit, sound regeneration had but a limited field. The only instruments calling for sound regenerating devices were the phonograph and gramophone, in which the movements of a stylus over the record were transmitted mechanically to the diaphragm, the Poulsen device in which a magnetized wire took the place of a record, and electric telephones, including the loud speaking telephone in use on board ship. In all these instruments the power available was small. Broadcasting was unknown, and loud-speakers, as now un-

> derstood, and thermionic valves and electric pick-ups for making high auxiliary power available had not appeared. It was, nevertheless, at that day, as I find, common knowledge that lightness and rigidity of the diaphragm were essential to success in reproducing sound from the instruments then known. I further find that *coning* the diaphragm to attain rigidity was a recognized expedient, and that it was also known that greater loudness could be attained *by enlarging the area of the diaphragm* and thereby moving a greater volume of air'' (Lektophone Litigation, pp. 194-5).

In radio loud speakers, the diaphragm is actuated by an electrically operated unit which affords ample power at all frequencies. The power delivered by such a unit is many times stronger than the power available from the vibration of a needle operating in the sound grooves of a phonograph record, and mechanically connected to the diaphragm. It is by reason of this power available in a radio loud speaker, that a diaphragm can be caused to ''blast,'' but this is not an action that is peculiar to a conical diaphragm. Any diaphragm will ''blast'' upon applying too much power, including those made in accordance with the alleged invention of plaintiff's patent, as well as those made by defendant.[41]

There is a vast difference between the action of imparting the vibrations to the apex of the Hopkins patented cone by means of the phonograph needle and that of applying the power to a diaphragm, or cone, by means of *an electric unit*. It will be at once realized that where only a limited amount of power is available, as in the case of the phonograph needle, it is necessary that the cone be supported independently of the needle, as by the relatively stiff rim *l* of

[41] R. pp. 52-53.

plaintiff's patent; whereas in the case of the electrically operated unit, such as defendant uses, the diaphragm or cone may be supported entirely at its apex, and the limp leather rim does not "maintain the form and neutral position" of the cone.

A similar finding was made in respect to the corresponding British patent (Lektophone Litigation, p. 192), as follows:

> "The view which I have taken of the construction of the specification would be sufficient to dispose of the action as the alleged infringing article is a loudspeaker in the modern sense for use in connection with the reception of broadcasted matter and is not constructed for use on a record and stylus machine, though it can, by means of an electric pick-up, be operated from such a machine" (Lektophone Litigation, p. 204).

This holding was affirmed by the Court of Appeal (Lektophone Litigation, p. 214).

We turn now to the specific differences between the device of the patent and the Rola loud speaker. They are summarized in the Summary of the Argument and will now be discussed more in detail.

(1) In the device of the patent, (a) the area of the tympanum as that word is defined and used by the patentee comprises the entire structure between the apex of the cone and the rings K, K', including the annular rim as well as the cone, (b) the diameter of the tympanum must exceed 9 inches, (c) the entire tympanum is of crisp, vibratile material, and (d) the outer edge of this crisp, vibratile tympanum is rigidly mounted in the rings K.

(2) In the defendant's device, (a) the area of the tympanum comprises only a part and not all of the structure

between the apex and the rings, *i. e.*, only the cone and not the flexible rim, (b) the diameter of the base of the tympanum is materially less than nine inches; *i. e.*, 7 9/16 inches, (c) the flexible rim between the tympanum and the metal frame is neither crisp nor stiff nor vibratile; it is limp kid leather, and (d) the outer edge of the crisp, vibratile tympanum is not rigidly mounted in the metal frame; it is flexibly supported from the metal frame by the limp leather rim.

The Device of the Patent.

(a) In the Device of the Patent, the Area of the Tympanum Comprises the Entire Structure Between the Apex of the Cone and the Rings K, Including the Annular Rim as Well as the Cone.

This seems to us to be plainly established by the patent and the record, yet the plaintiff asserts another meaning for the word "tympanum," namely, as referring in substance only to the conical portion. (See p. 49 of Petitioner's Brief.)

As the word cannot fairly be given one meaning in respect of validity and another in respect of infringement we will make some reference to the patent and to the evidence to demonstrate that by "tympanum" Hopkins meant more than the conical portion and included the whole structure within the aperture of the rings K.

The language of the patent specification supports this statement with perfect clearness (R. 187):

> "*The tympanum L, which forms the subject of the present case,* is constructed of light, vibratile material and *has an annular plane peripheral portion or supporting rim l,* the outer edge of which is tightly gripped, and rigidly supported between the

> rings K, K', *and a central conical portion l'* rising from the inner edge of the said rim *l*. If satisfactory regeneration of sounds from a record or other sound-vibrated element is to be had, *the whole diameter of the tympanum, that is, the diameter of the aperture in rings* the K, K' should exceed nine inches in order that the conditions required to regenerate the sound waves in the manner above described shall be fulfilled. The base of the central conical portion *l'* should exceed in area one-half of *the effective area of the entire tympanum, that is, the area of the* aperature in the rings K, K'.;"

The patentee here explicitly describes the *diameter of the tympanum* as being equal to the *diameter of the aperture in the rings,* and the *effective area of the entire tympanum* as being equal to *the area of the aperture in the rings.*

The patent is expressly directed to "a tympanum of novel construction." (R. p. 164.) If the tympanum of the patent comprised no more than the cone there would be nothing novel about it. Cone-shaped tympana were admittedly old.

If Hopkins did anything, it was to extend the crisp vibratile material of his tympanum beyond the edge of the cone in the form of a flat, annular rim, integral with the cone.

His "tympanum of novel construction" as he plainly describes and claims it, consists of this single element, homogeneous, integral and continuous as to material, but shaped into two portions, the conical portion and the annular rim portion.

It is over and over again repeated in the claims that the tympanum of the patent includes both the cone and the

annular rim. If the rim is not a part of the tympanum then the claims are misdescriptive and do not apply.

Claims 1-3 call for "a tympanum rigidly supported at its periphery." The only rigid support shown in the patent is at the periphery of the annular rim. Hence the rim must be an effective part of the tympanum to respond to the call of the claims.

Moreover, the tympanum is defined in every one of the claims of the patent as having "a conical portion." The cone is thus *only a "portion"* of the Hopkins tympanum.

Claims 4 and 5 call for "a light tympanum * * * having its outer edge rigidly mounted on said support."

Claim 6 calls for "a light, vibratile tympanum * * * having its outer edge secured to said support; said tympanum being shaped to provide an annular rim * * * and a conical portion."

Claim 7 is similar.

Claim 8 describes the tympanum as "embodying a * * * conical portion and an annular rim."

References need not be multiplied. Appellant's witness, Clair L. Farrand, a director of the appellant company, said at page 107 of the Record:

> "I am using the word 'tympanum' as used in the Hopkins patent, meaning *the area enclosed within the rings.*"

(b) The Diameter of the Tympanum Must Exceed Nine Inches.

This limitation is explicitly stated in all but Claims 4 and 8.

In asserting infringement by the substantially smaller Rola device the plaintiff is placed in this dilemma.

Either (a) there is some magic in the nine inch dimension and it is a critical dividing line which brings into effect new and patentable results; or (b), nine inches is only a preferred dimension giving results which differ only in degree from the results of other sizes. If the former is correct, the plaintiff cannot complain if the Courts and the public take the patentee at his word; if the latter, the patent is invalid for uncertainty as well as lack of invention. To support validity, the plaintiff seizes the first horn of this dilemma; to support infringement he drops the first and seizes the second.

As to claims 4 and 8 we believe they are invalid because they fall precisely within the rule in *Minerals Separation* v. *Hyde, supra.* But even assuming that the claims may be saved from uncertainty by reading into them limitations from the specification, it is obvious that the limitations must be based upon the *structure* shown and described, with its essential nine inch or greater diameter, and not, as plaintiff argues, on *results*,—even assuming that results in the radio loud speaker field (which Hopkins never dreamed of at the time of his alleged invention) may be compared with the unproved results of Hopkins' device which was never built, except experimentally.

The phrases qualifying the area of the tympanum in Claims 4 and 8 are not clear unless read in the light of the specification language. "Self-sustaining sound waves" and "sound waves substantially corresponding in intensity to the original sound waves" can admittedly be produced by tympana of widely different areas and of areas far smaller than any contemplated in Hopkins' patent. (R. pp. 80 and 81.) On Hopkins' own admission those expressions do not mean much today as applied to loud speakers (R. p. 80); and they have no meaning in the patent unless limited to

the dimensions specified. This is clear from the specification. It states (R. p. 187):

> "If satisfactory regeneration of sounds from a record or other sound-vibrated element is to be had, the whole diameter of the tympanum, that is, the diameter of the aperture in the rings K, K′ *should exceed nine inches* in order that the conditions required to regenerate the sound waves in the manner above described shall be fulfilled."

Here the patentee definitely associates a minimum of nine inches for the whole diameter of the tympanum with satisfactory regeneration of sound waves "in the manner above described," *i. e.*, "of an intensity and amplitude substantially corresponding to the original sound waves" (R. p. 164.) This is the type of regenerated sound waves referred to in these claims. And if the patent teaches anything in respect of regeneration of such sound waves it is that the "whole diameter of the tympanum, that is the diameter of the aperture in the rings K, K′ should exceed nine inches".

The file wrapper contains repeated representations of fact, made to the Examiner in this regard, and which plainly influenced him to allow claims of the character in question. Thus at R. p. 226:

> "Applicant has practically demonstrated that, to effect direct regeneration from the record of the sounds, a light vibratile tympanum of *substantially 9 inches in diameter or greater* must be employed in order to obtain faithful reproductions."

Again, at page 227:

> "*The dimensions* of the diaphragm and of the conical portion thereof, as set forth in claims 15 to 20 inclusive, *are essential elements* in a direct sound

regenerator, but they are not essential in sound boxes which employ horns or trumpets as do all of the references which have been cited against these claims. This has been demonstrated by the applicant by actual trial."

Again, at page 253:

"We believe that it will now be apparent to the Examiner that the selection of the *particular dimensions is of the essence* of the invention and attains novel results arising from the particular dimensions and such as could not be obtained by the devices shown in the references."

Again, at page 267:

"*It is essential* to the success of applicant's machine that the tympanum be of large area and that the base of the vibratile portion thereof *exceed nine inches* in diameter, and furthermore that the peripheral edge of the tympanum, exterior of the vibratile portion, be rigidly secured or tightly gripped between the rings of the supporting frame. These definitions of the *essential characteristics* of the invention have been included in the claims by the amendments aforesaid, and said claims are, therefore, believed to be allowable."

* * * * * * * *

"Applicant has demonstrated that his invention is not wholly satisfactory when the conical tympanum is made with a basal diameter of less than nine inches."

The file wrapper shows that the applicant went to the extreme of transporting the Patent Office Examiner and his assistants to New York and there demonstrating to them, at the office of his attorneys:

> "that the machine embodying the present invention did reproduce sounds or sound waves substantially corresponding in intensity to the recorded sound waves" (R. p. 268).

It goes without saying that the machine so demonstrated had a tympanum of diameter exceeding nine inches and was a part and parcel of a phonograph.

Plainly there was a meeting of the minds of the applicant, his attorneys and the Patent Office officials at that demonstration that tympanum of nine inches or more diameter was essential in Hopkins' phonograph to produce "self-sustaining sound waves" or "sound waves substantially corresponding in intensity to the original sound waves"; and plainly in allowing such claims as 4 and 8 the Examiner understood them as excluding in fact devices having tympana of less than nine inches diameter, because, in the Hopkins combination, such devices must fall short of the character of sound regeneration called for.

In short, the requirement as to the character of the regenerated sound waves in Claims 4 and 8, while ambiguous and indefinite in itself, is intelligible if and only if the claim language be read in the light of the patent disclosure; and that disclosure plainly teaches that the dividing line between tympana capable of such regeneration and those not so capable is fixed at a minimum diameter of nine inches.

It is urged by plaintiff that if Claims 4 and 8 have read into them the condition that the tympanum exceed nine inches in diameter they will then be identical with other claims in the patent and "the practical effect would be to strike Claims 4 and 8 from the patent."

A reading of the claims, however, will show that Claim 4 differs from each and all of the other claims in respect

to the qualification that the base of the conical portion "exceeds in area one-half of the effective area of the said tympanum." No other claim in the patent contains any such provision. Claim 8 differs from all the other claims in that while it describes the conical portion and annular rim it does not specify any particular proportion as between the conical portion and rim, nor any particular altitude of cone. Therefore, reading into these claims the very point which the Examiner must have had in mind in allowing them, namely, that the diameter of the tympanum shall exceed 9 inches, would in no wise render them identical with the other claims in the patent, and would simply be giving effect to Hopkins' representations made to the Patent Office that it is essential that the base of the vibratile portion exceed 9 inches in diameter. In fact, if such a condition be not read into these claims, then they are void for indefiniteness and uncertainty, as before shown.

The disclosure and teaching of the patent are of a limited invention wherein certain dimensions, shapes, proportions, and materials are of the essence; and the plaintiff attempts to justify an interpretation of the claims broader than the disclosure. There is no authority for any such interpretation:

> *Gates* v. *Fraser*, 153 U. S. 332;
> *I. T. S. Rubber Co.* v. *Essex*, 272 U. S. 429;
> *Jewell Filter* v. *Jackson*, 140 Fed. 340;
> *D'Arcy* v. *Marshall*, 259 Fed. 236.

In the latter case Judge Denison, speaking for the Court of Appeals, Sixth Circuit, said:

> "From a review of these and other familiar cases, we think it is safe to deduce the proposition that where the claim defines an element in terms

> of its form, material, location or function, thereby apparently creating an express limitation, where that limitation pertains to the inventive step rather than to its mere environment, and where it imports *a substantial function* which the patentee *considered of importance to his* invention, the court can not be permitted to say that other forms, which the inventor thus declared not equivalent to what he claimed as his invention, are nevertheless to be treated as equivalent, even though the court may conclude that his actual invention was of a scope which would have permitted the broader equivalency." (At p. 240.)

(c) The Entire Tympanum of Hopkins is of Crisp, Vibratile Material.

The patent discloses a unitary *integral* tympanum, and only such a tympanum. It comprises two portions, the cone and the rim, but the teaching of the patent is that the two portions shall be formed of a single piece, and that the whole shall be of crisp vibratile material.

The patent specification says (R. 187):

> "The tympanum L, which forms the subject of the present case, is constructed of light, *vibratile* material and has an annular plane peripheral portion or supporting rim *l*, the outer edge of which is tightly gripped and rigidly supported between the rings K, K', and a central conical portion *l'* rising from the inner edge of the said rim *l*."

The tympanum L embraces the two elements (1) the "central conical portion *l'*," and (2) the "annular plane peripheral portion or rim *l*." They are two portions of a single, homogeneous whole, and the whole is described as constructed of "light, vibratile material."

In more specifically describing the material of the tympanum, the specification goes on to say (R. p. 187):

> "It is of vital importance that the tympanum be made of crisp, strong material, having considerable rigidity within itself, and it is also of vital importance that the tympanum as a whole be extremely light and have as little inertia as possible without a weakening effect."

Then referring to the shape of the conical portion, the specification proceeds (R. p. 187):

> "The tympanum is shown of conical form with a smooth surface, and this has been found to be very satisfactory. The conical shape is given the tympanum so that shocks or vibrations impressed upon the apex of the cone in a direction toward its base will move the whole cone bodily, the strains being imparted edgewise of the material and no wave motions being set up in the thin material of the cone. The curvature of the walls of the cone precludes the setting up of waves in the material; and the intended object, a simultaneous movement of the whole conical portion of the tympanum, is thus attained."

Immediately following, comes reference to the shape of the annular rim (R. p. 188):

> "While I prefer to construct the tympanum in the form described and shown with a smooth surface, especially in view of the ease of construction, yet it is possible to form radial or concentric corrugations in the plane peripheral portion *l* and produce a light, *stiff* and very satisfactory article for the purpose."

And finally, referring to the tympanum L as a whole, the specification says (R. p. 188):

> "The tympanum should preferably be constructed of a colloidal substance, and should be from 3 to 20 thousandths of an inch in thickness according to the crispness or stiff character of the material used. Compressed fibrous material, such as hot pressed paper or fiber, has been found to act satisfactorily."

There is not the slightest suggestion in the specification or in the claims or in the file wrapper of any form of tympanum other than one that is constructed of homogeneous material throughout both the cone portion and the rim. And the teaching of the patent is that "it is of vital importance" that this unitary tympanum, from the apex of the conical portion to the outer edge of the supporting rim where it "is tightly gripped and rigidly supported between the rings K, K'," "be made of crisp, strong material having considerable rigidity within itself."

Plaintiff contends (brief, p. 48) that when the patent says "that it is of vital importance that the *tympanum* be made of crisp, strong material, having considerable rigidity within itself", that it means the *conical* portion of the tympanum because of the use in the same sentence of the words "tympanum as a whole" etc. This is opposed to the patent's own definition of the tympanum, which is—"an annular plane peripheral portion or supporting rim * * * *and* a central conical portion". It is stated, in the part of the specifications where the tympanum is said to consist of these two elements, that the "tympanum", *not a portion of it,* shall be "of light, *vibratile* material". The patent shows the annular rim is constructed of the same material as the conical portion, and, indeed, a continuation thereof. Furthermore, the reference in the patent to the suggested corrugations in the rim do not support the

idea that the rim is not to be of crisp, strong material, but quite the contrary, because, if the rim were of limp material, such as the leather of the defendant's device or the cloth of the Miller device, no corrugations could be made in it which would produce a "stiff" rim. We submit that, in view of these considerations, it must be held that when the patentee used the words "that the tympanum be made of crisp, strong material" he meant the *whole* tympanum, as the Courts below held, and not merely the conical portion thereof.

In this connection we direct attention to the fact that one of the members of the firm that solicited the patent in suit, together with one Joss, on May 13, 1918, filed an application for a patent which was granted to the plaintiff herein, as assignee in 1921.[42] The specification of this patent contained criticism of the structure such as shown in the Hopkins patents and states:

> "The object of the present invention is to improve a diaphragm of this character, by so constructing it as to reduce to a very large degree, if not entirely, the possible distortion of the vibrations transmitted to or imparted by, the diaphragm, *due, in part, to the direct and rather rigid connection of the base of the cone to the supporting rim or flange* (which has the effect of somewhat damping the vibrations), and, in part, to the cone base itself, which may, perhaps, exert a similar action, but in less degree, by reason of such connection. This object is effected by avoiding *the direct connection just referred to*, and, instead, joining the base of the cone to the supporting rim or flange by a curved, open-topped trough, which provides a *resilient mounting* for the cone and is constructed and arranged in such a way as to destroy distortive action due to the pres-

[42] R. p. 477.

ence of the rim and at the same time to resiliently support the cone itself." (R. p. 477.)

It thus appears that Hopkins, according to admissions of his associates, attorneys, and assignee, made five years after the filing date of Hopkins, had in contemplation a direct and rather rigid, resonant connection between the cone and supporting rings, and that when Davis and Joss attempted to construct one of the Hopkins devices they found it necessary to make such changes in the rim of the cone as to lead them to believe that they had made a new and important discovery which justified a patent, when they provided a less rigid flange or base for the cone.

(d) The Outer Edge of this Crisp, Vibratile Tympanum is Rigidly Mounted in the Rings K.

This point needs no exposition. Every one of the claims of the patent introduces it in one form or another.

Claims 1, 2 and 3 call for "a tympanum *rigidly supported* at its periphery."

Claim 4 calls for "a tympanum support having a circular aperture, and a light tympanum freely exposed to unconfined air and having its outer edge *rigidly mounted* on said support in said aperture;"

Claim 5 calls for "a light vibratile tympanum exceeding nine inches in diameter, having its outer edge *rigidly mounted* on said support."

Claim 7 calls for the support, and a tympanum "having its outer edge *rigidly secured* to said support."

The same thought by inference appears in Claim 6.

Claim 8 calls for "a tympanum embodying a bodily movable, central conical portion, and an annular rim which encircles said conical portion and which is *rigidly supported*".

The Defendant's Device.

(a) In Rola, the Effective Area of the Tympanum Comprises Only a Part and Not All of the Structure Between the Apex and the Rings, i. e., Only the Cone and Not the Flexible Rim.

The paper cone of the Rola structure is the only part which functions as a tympanum.

According to the *Encyclopedia Brittanica,* the word "tympanum" comes from Greek roots meaning "to strike." By the Romans it was used to designate a kettle drum. Its modern meaning probably extends to vibratile sounding boards of light, stiff material whereby mechanical vibrations are transformed into sound waves over a relatively broad front; *i. e.,* a sound generating diaphragm.

Only the cone proper of the Rola device constitutes a true tympanum.

The limp kid leather rim is neither "crisp" nor "stiff." It has little or no "rigidity within itself." It is not appreciably "vibratile," it does not produce audible sounds and it functions as a sound *deadener* rather than a *generator.*

Defendant's witness, Tenny, said of it (R. p. 49):

> "Q. Does that leather band at the base of the cone form any part of the sounding-board or tympanum?
>
> A. Only in a very minor and imperceptible sense. The leather, while it has a certain amount of rigidity, its rigidity is absolutely insignificant compared to the greater rigidity of the cone diaphragm. In other words, when the cone moves forward, for instance, it will drag a very small portion of that leather forward with it, but the rest of the leather, because of its inertia, and because of the pressure of air, will lag behind, and stay more or less permanent."

Plaintiff's witness, Hazeltine, substantially agreed (R. p. 32):

> "Q. But in the defendant's device that limp leather is not any part of the sounding-board, is it?
> A. It is not an important part. There must be some vibration, therefore some sound produced by it.
> Q. Not audible, though?
> A. That is a matter of degree. It is not important, I said."

The witness Jensen, who has had large experience as a telephone engineer, testified as follows:

> "As to my understanding of the term 'tympanum' as used in the telephony art—a tympanum is, according to the understanding among acoustic and telephone engineers, a stretched diaphragm which will emit a sound when vibrated. The tympanum of Defendant's Exhibit 15 is the stiff part, which, in this case, is the paper. As to whether the kid leather band is a part of the tympanum—if I were speaking to a body of acoustical engineers, or electrical engineers, and tried to tell them that this was a tympanum, that soft kid leather, I think they would smile at me." (R. p. 68.)

The area of the vibratile sounding board of the Rola structure ends at the edge of the cone. The cone is the whole of the effective tympanum. The Rola cone is not the "tympanum of novel construction" of the Hopkins patent; its edges do not extend *integrally* beyond the cone in the form of an annular rim; its limp leather rim is not of one piece with the cone, nor is it crisp, vibratile, "having considerable rigidity within itself"; it has no appreciable or audible function in transforming mechanical vibrations into sound waves; it is, rather, an inert and flexible support for the outer edge of the cone tympanum and a curtain

forming part of the baffle separating the air spaces on the convex and concave sides of the cone.

The stiff paper cone and limp leather rim of Rola are not equivalent to the "tympanum of novel construction" of Hopkins either in function, purpose, or legal significance. As said by Judge Bourquin (27 F. (2d), 758):

> "In defendant's device only the cone is of crisp vibratile material, the flat rim being of limp kid, and the former alone effectively vibrates.
>
> The material of the one differs from that of the other, as do things differing in nature.
>
> *Hopkins discovered and invented the one, but not the other, and his patents teach that the first is vital to success and that the second spells failure.*" (Lektophone Litigation, p. 80.)

(b) The Diameter of the Base of the Effective Tympanum of Rola is Materially Less Than Nine Inches.

In Plaintiff's Exhibit No. 4 the legend "tympanum" is improperly applied to the diameter of the aperture in the metal frame. Even this is less than nine inches. But the diameter of the *effective* tympanum of Rola is not that of the aperture in the metal frame, but that of the base of the cone, which is seven and nine sixteenths inches. The diameter of the tympanum of Rola is thus 16% less than the minimum diameter of the tympanum of the patent. And the area of the base of the tympanum of Rola is about 30% less than the minimum area of the tympanum of the patent.

For reasons sufficiently discussed above, this disparity excludes the Rola structure from the scope of the claims.

(c) The Flexible Rim Between the Tympanum and the Metal Frame of Rola is Neither Crisp Nor Stiff Nor Vibratile; it is Limp Kid Leather.

Plaintiff cannot deny that this is so as a matter of fact. It attempts to meet the situation by an argument of equivalence.

Looking to the character of material alone, there is certainly no similarity between limp kid leather and the crisp, stiff tympanum material so carefully described as being "of vital importance" in the patent.

The argument of equivalence must then depend not upon similarity of material but supposed similarity of function.

But the weight of evidence is opposed to the argument.

The defendant's rim is not to any appreciable extent a part of the sounding board (R. p. 49) as in the case of the vibratile rim of the Hopkins device. It does not support the cone stiffly in true axial alignment, as with Hopkins, but flexibly. It is not a part of the tympanum in sound regenerating function but rather a part of the baffle which cooperates with the small cone to make possible the reproduction of low tones.[43] It absorbs and dampens undesirable energy in the cone. (R. pp. 52-53.) Hopkins' rim has no such function.

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[43] Hazeltine, for plaintiff, said at R. p. 32:

"Q. But with the baffle and that small cone, you are able to produce those notes of low frequency which you otherwise would not obtain, isn't that a fact?

A. It is a matter of degree, but, generally speaking, that is true. You always get some low notes. You get more with the baffle than you would without."

The fact is that defendant and others, by proper electrical compensation and energy absorbing means by the use of a flexible inert rim and baffle wall and other improvements have achieved satisfactory sound regeneration for radio purposes by the use of conical tympana of different type from Hopkins and of less than nine inches diameter. The mere fact that they have achieved this result is not evidence of infringement. *Patents are not granted for results.* It is evidence, on the contrary, that they have found other combinations of means of different inventive character and kind and capable of achieving in a different way the results which Hopkins demonstrated could be achieved with his type of tympanum only when provided with a diameter in excess of nine inches.

Plaintiffs argue that because defendant's structure produces good results it employs the same mode of operation as Hopkins and is therefore an infringement.

The argument proceeds in a circle. Hopkins' device was never built except experimentally, and none was offered in evidence in this case. There is no evidence as to its mode of operation *except speculation.* What then is the basis of comparison upon which plaintiff depends? It is only by *assuming* that defendant's device and others, licensed or unlicensed, employ the same principles and functions as are said to be embodied in the Hopkins device, that plaintiff can argue any practical achievement at all for its patentee. To go further and say that *because* the accused devices employ these principles and functions, they embody a mode of operation and achieve a result that was new with Hopkins, simply completes the circle.

The assumption of equivalent mode of operation is fundamental to plaintiff's argument. The assumption cannot stand in the face of the proofs of the diametrically

opposed functions of the sound deadening rim of Rola and the sound generating rim of Hopkins. The assumption being fallacious, the whole argument of infringement falls.

The burden of demonstrating equivalence rests on the appellants.

> *Seymour* v. *Osborne,* 11 Wall. 516;
> *Railroad Co.* v. *Mellon,* 104 U. S. 119.

(d) The Outer Edge of the Crisp, Vibratile Tympanum of Rola is not Rigidly Mounted in the Metal Frame; it is Flexibly Supported from the Metal Frame by the Limp Leather Rim.

Here is a difference between the device of the patent and of the defendant which is not only functional but goes to express limitations in every claim of the patent.

Defendant's witness, Tenny, pointed out at R. pp. 52 and 53 some of the functional differences between the rigid support at the periphery of a tympanum of crisp, vibratile material throughout, such as Hopkins, and the flexible support, as by a limp leather rim, of a plain conical tympanum such as Rola's. The differences are matters of practical, scientific fact and we find nothing in the record to the contrary. Certainly they are not refuted by the complaisant generalization of plaintiff's expert to the effect that he believes the mode of operation of defendant's loud speaker is just the same as the mode of operation described in the Hopkins patent. The patent contains not one word or suggestion of the use of a different or more flexible material for the rim than for the cone, and accordingly Hazeltine's expressions concerning relative width of rim where more flexible material is used are entirely without basis in the patent, and represent only the wisdom of hindsight which is so common among patent experts.

Referring to the patent claims we observe that every one of them calls, in one form of words or another, for rigid mounting of the outer edge of the tympanum in the metal frame that bounds it. Direct *rigid* support of the tympanum itself is called for by every claim. Hopkins' tympanum of novel construction adapts itself to such support by reason of the flat or corrugated rim. But Rola's conical tympanum is not rigidly supported at its periphery and it is quite obvious that it could not operate if so supported.

It follows that none of the claims are infringed.

IV.

SOME SPECIFIC REPLIES TO, AND COMMENTS ON, SOME PARTS OF PETITIONER'S BRIEF.

What follows under this caption is not intended to be a complete answer to all of the contentions in the petitioner's brief but only to some of them. The others are necessarily answered, we think, by the arguments which we have heretofore advanced in support of the petitioner's various positions.

(a) At page 12 plaintiff's brief states:

> "Hopkins taught that the base area of his conical sounding-board should be not less than half the area of a tympanum (cone plus rim) nine inches in diameter. For the purpose of the present case that may be taken to be a cone having a minimum basal diameter of 7.2 inches—eight-tenths of nine inches."

This, in the language of Mr. Justice Sutherland in *Webster* v. *Splitdorf*, 264 U. S. 463, 466, is "an exigent afterthought rather than a logical development of the original application."

Hopkins did not teach anything other than that the diameter of the whole tympanum between the so-called "ponderous rings" should exceed nine inches; and any effort to show that a cone having a basal diameter of 7.2 inches comes within the teachings of the Hopkins patents, irrespective of the size and character of the rim, can not be justified under any reasonable interpretation.

In a footnote at the bottom of the same page of plaintiff's brief it is asserted that the figures given by Hopkins are not "mathematically accurate." This only adds to the indefiniteness and uncertainty of the patent in suit.

(b) At page 15 of plaintiff's brief it is stated:

> "So the inventor introduced between the mechanical framework of the device constituted by the rings K, K' and the vibrating cone itself, the plane peripheral portion or supporting rim *l* which *yieldingly* holds the vibrating cone in position."

The word "yieldingly" is stressed by italicized type and appears to be the feature of novelty relied upon by plaintiff; but there is no basis for this in the patent specification. Instead, the language of the patent is that the tympanum should "be made of crisp, strong, material having considerable rigidity within itself" and also should have "as little inertia as possible without a weakening effect." The "yielding," if any, permitted in the Hopkins structure, is akin to a spring, and in no wise equivalent to the flabby, flexible, thin leather rim employed by defendant.

(c) An important admission in plaintiff's brief appears at page 21, where it is stated:

> "The rim of defendant's structure is narrower than the Hopkins rim, thereby diminishing the overall

diameter of the tympanum to slightly less than nine inches, but the narrower rim is made of more flexible material so that the desirable flexibility is retained."

The brief then goes on to say:

"It is plaintiff's position, therefore, that this change in form is a mere colorable departure from the disclosure of the patent, and does not avoid infringement. We think no other conclusion can be reached unless (1) it appears that the patentee departed from the prior art only in his choice of the material of the rim so that the form (material) of the rim is of the essence of his invention, or (2) the language of the specification and the representations made in argument before the Patent Office are to be taken to exclude this change in the material of the rim." (p. 21.)

The answer to this is that the patentee is limited not only as to *size*, under the principles enunciated in the *Minerals Seperation* case, *supra*, but also as to the *material* of the rim, under the doctrine set forth in *White* v. *Dunbar*, 119 U. S. 47.

In the latter case the patentee attempted to assert a monopoly on all sorts of material used for enveloping shrimps preserved in cans. Throughout the specification, however, the material was referred to as "a textile material, preferably of cotton or muslin." The defendant employed a paper bag or envelope, and while some of the claims were broad enough to cover such paper material by indirection, this court said:

"We see nothing in all this to raise the slightest implication that the patentees were the inventors of the process of interposing any and every kind of lining between the cans and their contents."

To say that the more flexible the rim the narrower it can be simply begs the question. The patent does not deal with any particular size of rim. What it does require is that it shall be *stiff and vibratile* and a part of the sound generator. It necessarily must be large, on account of Hopkins' failure to employ a baffle board.[44]

(d) The statements on pages 37-38 of petitioner's brief may give the impression that Hopkins deliberately set out to rectify some of the alleged shortcomings of Starling & Cole. This is not correct. The Patent Office did not cite Starling & Cole, and nothing was said by Hopkins in any of his arguments before the Patent Office relative to the shortcomings of a free-edge cone such as Starling & Cole disclosed. As heretofore pointed out, the weaving or blasting was not a problem with Hopkins (who was dealing with phonographs), because of the small amount of power available to vibrate the cone in such instruments.

(e) Plaintiff's brief, page 39, says:

> "It was not in the material of the rim, but in throwing away the sound-box and horn and *enlarging* the structure to produce a direct-acting loudspeaker that Hopkins departed from the prior art of sound-box and horn structures. Having, by *this exercise of inventive ingenuity*, bridged the gap between the sound-box and horn constructions and the successful direct-acting loudspeaker, *it requires no more than engineering skill* for someone else to use in Hopkins' combination the rims of various materials that had previously been used in the small diaphragm constructions."

But as above shown, and as found by the courts below, others had already thrown away the sound-box and horn

[44] R. pp. 52-53.

and had sufficiently enlarged the structure of the conical diaphragm to produce a direct-acting loud speaker. As a matter of fact, no enlargement of the conical diaphragm over those theretofore employed in phonographs was required to produce direct action or so-called "self-sustaining sound waves," in a radio loud speaker, and this fact was demonstrated before the Court of Appeals and was referred to in the opinion of that court. (*Lektophone* v. *Rola*, 34 Fed. (2d) 764.)

The trade no doubt would use the smaller diaphragm except that in such cases a larger baffle or cabinet would have to be employed to avoid interference between the waves given off from the front and rear of the cone. Such a large baffle would take up too much space; and somewhere there has to be a compromise to suit the public's taste. It does not follow, however, that because the industry has seen fit to reduce the size of the baffle and enlarge the size of the conical diaphragm, Hopkins, who never understood or appreciated the importance of a baffle, should be given a monopoly on any device which might employ a conical diaphragm and give off so-called "self-sustaining sound waves."

The situation is no different from that of building houses or bathrooms. A bungalow or a bathroom of certain proportions may come into favor; but the architect or contractor who happened to be the first to construct a building or room of such proportions would not, under our laws, be considered as an inventor or discoverer. He is merely catering to the tastes of the public and following the skill of his calling, as expressed in *Concrete Appliances Co.* v. *Gomery, supra.*

It is difficult to reconcile plaintiff's statement wherein Hopkins' slight changes, if any, over the prior art are

designated as "the exercise of inventive genius," with the other assertion that the many changes and improvements made by pioneers in the radio loud speaker industry are "no more than engineering skill."

The quoted paragraph also refers to Hopkins' bridging some gap; but there was no gap to be bridged, so long as Hopkins remained in the phonographic art. The real gap to be bridged was the one wherein certain practices known to the acoustic art were adapted to the needs of loud speakers for radio purposes; and this certainly was not done by Hopkins, but by others, such as Farrand, Western Electric Company, and the present defendant.

(f) The authorities cited in the plaintiff's brief (pp. 40-42), and the rules deduced therefrom, do not assist the petitioner, because (a) Hopkins expressly made size an element of all of his claims but two, and, as before shown, he impliedly made it an element of those claims, and (b) on the matter of interpretation, the Court can not disregard what the patentee has said to the Patent Office are the essentials of his invention. *I. T. S. Rubber Co.* v. *Essex Rubber Co.*, 272 U. S. 429.

Moreover, the plaintiff cannot complain of any admissions in the file wrappers which are detrimental to it, because the file wrappers were offered by the plaintiff and received as its exhibits.

(g) On pages 59-60 of petitioner's brief, the statement is made that when, in a communication to the Patent Office, the solicitor said that it was essential that the "base of the *vibratile* portion" of the tympanum exceed 9 inches in diameter, and that "the peripheral edge of the tympanum, exterior of the *vibratile* portion be rigidly secured", he was in error, because it was never suggested in the specifications

that "the basal diameter of the conical *portion* of the tympanum should exceed 9 inches". On the contrary, it would seem clear that when the solicitor referred to the necessity of the "vibratile portion" exceeding 9 inches, he meant not only the cone, but the annular rim as well, because all through the specifications the latter is indicated by the patentee as a vibratile portion. There is no warrant for assuming that the solicitor was in error, but rather that the effort is made now to place upon the solicitor's language an unwarranted construction and thereby escape the stamp of approval which he then gave to the present contention of the defendant, *i. e.*, that the rim is a necessary part of the tympanum as defined by Hopkins and serves to reproduce sounds. The Court of Appeals for the Second Circuit in the *Sylo* case, has termed this a "sounding rim". The Appellate Court in the present case has made similar findings, and such was the finding of both courts in the *British* case.[45]

It must be borne in mind that Hopkins was a patent solicitor himself and in the employ of the attorneys who solicited the patent, organized the plaintiff corporation, and are now litigating the patent (R. p. 77).

The expression "exterior of the vibratile portion" undoubtedly means that part of the plane which is clamped between the ponderous rings and which, by reason of the clamping, is not vibratile.

(h) We accept and adopt the statement of plaintiff's counsel (page 63 of plaintiff's brief) as follows:

> "The true inquiry is: What mode of operation is introduced and employed, and what result is attained by the structure or device *illustrated and de-*

[45] Lektophone Litigation, p. 17.

scribed as the preferred embodiment of the invention, and whether defendant's combination of elements performs substantially the same function in substantially the same way to obtain the same result?"

This court, will, we think, have no difficulty in finding, as did the other courts, that the result attained by the structure or device illustrated and described as the preferred embodiment of Hopkins' alleged invention was reproduction of sound waves from a phonograph record without the use of a horn, which result had already been accomplished in the prior art. That the defendant's combination of elements does not perform the same function in substantially the same way as plaintiff's combination is obvious from the fact that defendant employs a much smaller diaphragm, a different character of rim, a baffle board, and actuates this diaphragm through electrical impulses greatly augmented and amplified by resort to vacuum tubes and batteries or other source of electrical energy peculiar to radio reception.

(i) At page 68 of plaintiff's brief it is admitted that the Starling and Cole device was a scientifically correct idea, but it is contended that it failed of practical commercial reality because of lack of support at the base, which feature was already well known to the industry long prior to Hopkins' appearance in the field. The record clearly shows that Hopkins did not achieve any commercial success in the particular art in which he was struggling (that is to say, the phonographic art), and that little or nothing was known of the Hopkins device from the time that he filed his application, back in 1913, until after the time that radio broadcasting came into prominence and

that the Hopkins device could not successfully be adapted to radio purposes without considerable changes and improvements; and whatever recognition was given to it was by reason of its "nuisance value".

CONCLUSION.

IT IS RESPECTFULLY SUBMITTED THAT THE DECREE OF THE COURT BELOW SHOULD BE AFFIRMED.

Respectfully submitted,

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APPENDIX.

The French and German Decisions.

No note has been taken in this brief of the French and German decisions referred to in plaintiff's brief, because the laws of those countries are so different from the American and British laws. A few brief comments are made on these cases, however, in order to show that because of the peculiar facts pertaining to them, quite irrespective of the difference in the laws, they cannot be considered as of any weight in the case at bar.

Chanoit* v. *Davis*, *Court of Appeals of Paris (Lektophone Litigation, p. 164):

The action appears to have been based upon the Davis patent of 1914 corresponding, apparently, to the Hopkins patents in suit, and likewise upon later patents taken out in 1920 by Compagnie Pathe. There was also a question of trade mark infringement involved in the suit. The decision was in favor of plaintiff. No clear description of defendant's device appears from a reading of the decision, except that defendant's devices

> "are light, rigid, of conical form, are elastically supported and have a diameter at the base greater than the minimum diameter advised by the Davis patent." (Lektophone Litigation, p. 166.)

and that

> "the party Chanoit, moreover, recognizes that their devices comprise a tympanum similar to that of the Davis patent, and that it has the stylus fixed to the apex of the tympanum in the manner described in the Pathe patent." (Lektophone Litigation, p. 167.)

Mention of a stylus in the foregoing quotation indicates that the defendant was in all likelihood putting out a sound regenerator for phonographs, since there is no such thing as a stylus employed in connection with radio loud speakers.

For the foregoing reasons it is not seen where there is anything in this French decision helpful to plaintiff's case herein.

The French Decisions in Davis et al. v. Radio-Electrique:

This case appears to have involved a question of estoppel. For example, the lower court, Civil Tribunal of the Seine (pp. 181, 182, Lektophone Litigation) points out that defendant had previously been purchasing loud speakers from the plaintiff and had a certain trade agreement in the nature of a license.

The character of the defendant's loud speaker in this case is not shown by the record, but apparently was considered by the court to be a close copy of the device of the patent (Lektophone Litigation, p. 189).

The German Case (Lektophone Litigation, p. 227):

This decision in the *German* case is not clear on account of lack of information as to what devices were before the Provincial Court of Berlin, and the status of the various parties. In any event, the practice in Germany under patent law is quite different from that obtaining in this country, for the reason that once a German patent has been granted and a certain time elapses for the filing of an opposition, the patent becomes more or less inviolate, and an alleged infringer must proceed by way of an action to revoke the patent. Thus, the one who would be the defendant

under our practice becomes the plaintiff under German practice, and is shouldered with a heavy burden of proof.

So-called "friendly suits" are not uncommon in Germany for the purpose of establishing the status of a patent; and something of this character is suggested where the Provincial Court refers to the attitude of a certain Association of Broadcasting, as follows:

> "As mentioned by plaintiffs themselves, counsel for the Association of the Broadcasting Industry have changed their opinion, and the Association of the Broadcasting Industry have taken a license." (Lektophone Litigation, p. 255.)

Moreover, it appears that the plaintiffs (which under our practice would be the defendants) were at one stage or another a licensee under the German patent; and it is stated at page 230:

> "After the discontinuance of their license agreement Plaintiffs firstly brought a suit for declaratory judgment that the cone loud speakers manufactured by them did not come within the scope of Defendant's patents."

This, of course, under our law would bring up a serious question of estoppel, not only to deny validity of the patent, but likewise the scope thereof, depending upon what the parties had done under the license agreement.

It is submitted that little or no weight can be attached to a decision of this character, where all of the facts are not revealed by the record, and emanating from a country whose practice differs radically from that of this country.